TETRA TECH

February 24, 2012

Mr. Roy Crossland
START Project Officer
U.S. Environmental Protection Agency, Region 7
901 North 5th Street
Kansas City, Kansas 66101

Subject: **Site Reassessment Inspection, Revision 1**
Atlantic Water Supply Site, Atlantic, Cass County, Iowa
EPA ID: IAD039954300
U.S. EPA Region 7 START 3, Contract No. EP-S7-06-01, Task Order No. 0258
Task Monitor: Ron King, EPA Site Assessment Manager

Dear Mr. Crossland:

Tetra Tech EM Inc. is submitting the enclosed revised Site Reassessment report for the above-referenced site. The report addresses EPA comments received February 24, 2012. A Hazard Ranking System scoring memorandum will be submitted separately. If you have any questions or comments regarding this submittal, please contact the project manager at (816) 412-1788.

Sincerely,

David Zimmermann, CHMM
START Project Manager

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START Program Manager

Enclosures

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SITE REASSESSMENT, REVISION 1
ATLANTIC WATER SUPPLY SITE
CASS COUNTY, IOWA
CERCLIS ID No. IAD039954300

Superfund Technical Assessment and Response Team (START) 3

Contract No. EP-S7-06-01, Task Order No. 0258

Prepared For:

U.S. Environmental Protection Agency
Region 7
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February 24, 2012

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1.0 INTRODUCTION

Tetra Tech EM Inc. (Tetra Tech) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division, under the Superfund Technical Assessment and Response Team (START) 3 Contract Number EP-S7-06-01, Task Order Number 0258, to conduct a Site Reassessment of the Atlantic Water Supply site in Atlantic, Cass County, Iowa (see Appendix A, Figure 1). In 1982, tetrachloroethene (also known as tetrachloroethylene, perchloroethylene, or PCE) was first reported in one of the water supply wells for Atlantic Municipal Utilities (AMU). The Atlantic Water Supply site was entered into the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) in January 1986 with the Identification (ID) Number IAD039954300. A Preliminary Assessment (PA) was completed in November 1986, a Hazard Ranking System (HRS) scoring report was completed in April 1988, and a site inspection (SI) report was completed in July 1988. HRS scoring was done using the original HRS to derive an overall site score of 26.14, below the 28.50 score required for National Priorities List (NPL) consideration. The site was referred to the removal program for further consideration. A removal assessment was completed in April 2004 and additional technical assessment to evaluate the feasibility of implementing remedial alternatives for the groundwater contamination was completed in January 2007. These previous investigations are described in more detail below.

This site reassessment was to document current groundwater concentrations at the source and in down gradient municipal wells to assess threats posed to public health, welfare, or the environment; and to determine if further investigation under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)/ Superfund Amendments and Reauthorization Act (SARA) is warranted. The scope of the Site Reassessment includes review of information available from federal, state, and local agencies; sampling to identify releases of hazardous substances to the environment and their dispersal pathways; and assessment of need for a removal activity.

Using these sources of existing information and sampling data, the facility is evaluated using the EPA HRS criteria to assess the relative threat associated with actual or potential releases of hazardous substances at the facility. The HRS has been adopted by the EPA to help set priorities for further evaluation and eventual remedial action at hazardous waste sites. The HRS is the primary method of determining a site's eligibility for placement on the NPL. The NPL identifies facilities at which the EPA may conduct remedial response actions. This report summarizes the findings of these preliminary investigative activities.

Apparent Problem

The municipal water supply well field in Atlantic, Iowa, has been impacted by PCE at concentrations exceeding the 5 micrograms per liter (µg/L) maximum contaminant level (MCL). Lesser concentrations of breakdown products such as trichloroethene (TCE), and 1,2-dichloroethene (DCE) have been reported sporadically (Terra Tech 2004). At the source, a former dry cleaners, approximately 40 feet of silts and clays overlie the fine- to coarse-grained friable Dakota sandstone that supplies the City of Atlantic's (City) municipal well field. The silt and clay soils have been contaminated with PCE at depths too deep for physical removal or conventional remediation. The groundwater flows north-northwest from the source area toward the municipal well field, and the plume of contamination follows the groundwater gradient.

2.0 SITE DESCRIPTION

This section discusses location, description, available information regarding potential source areas, waste characteristics, and previous regulatory involvement and investigations at the Atlantic Water Supply site.

2.1 SITE LOCATION

Atlantic, Iowa, is a rural community in northeastern Cass County, about 75 miles west of Des Moines, Iowa, and 45 miles northeast of Council Bluffs, Iowa (see Appendix A, Figure 1). The apparent source of contamination at the Atlantic Water Supply site at 1205 East 7th Street (also known as U.S. Highway 6 and State Highway 83) is a former dry cleaning facility, the Norge Dry Cleaning Village, operated at this location during the 1960s (see Appendix A, Figure 2). The approximate coordinates of the former dry cleaner are latitude 41.403718° north and longitude 94.995763° west. Though the exact dates of operation are not known, the dry cleaning facility was listed in the 1962 Atlantic City Directory (Atlantic, Iowa 1962). In 1974, the Iowa Department of Transportation (IDOT) leased the site as a materials testing laboratory. IDOT relocated its operation in March 1986 to a site east of the city. It is suspected that the dry cleaning operations and IDOT routinely used solvents (Ecology & Environment, Inc. [E&E] 1988).

Based on the historical aerial photographs of the site (Historical Information Gatherers [HIG] 2003), the building that housed the former dry cleaner and IDOT laboratory was razed between 1982 and 1994. The area is now owned by the Rolling Hills Bank and Trust. A Burger King restaurant (formerly a Hardee's restaurant) is about 300 feet east of the former dry cleaning location. Land use surrounding the site is a mix of commercial and residential. The City's municipal well field is between 0.50 to 1 mile north of the former dry cleaner location (see Appendix A, Figure 3).

2.2 SITE DESCRIPTION

The municipal water supply well field in Atlantic, Iowa, has been impacted by PCE. At the source, approximately 40 feet of silts and clays overlie fine- to coarse-grained friable sandstone that supplies the AMU well field.

Currently, the PCE contamination continues to migrate down into the sandstone aquifer, and travel horizontally in this aquifer to the City's municipal well field. The well nearest to the source area (AMU-7) was first found to contain PCE in 1982 (reported at a concentration of 170 µg/L) (E&E 1988). AMU-7 was disconnected from the system and is currently being pumped continually to the AMU wastewater treatment plant to provide hydraulic control and protect nine other municipal wells from contamination.

Currently, nine active municipal wells serve the 7,475 citizens in and around Atlantic, Iowa. Eight wells (AMU-10 through AMU-17) are on the north side of Troublesome Creek between 0.5 and 1 mile from the former dry cleaner site (see Appendix A, Figure 3). Wells AMU-6 and -7 are on the south side of the creek. For the nine active wells, depths range from approximately 75 to 98 feet below ground surface (bgs), with an average of 87 feet bgs (AMU well data). Other wells previously on the south side of the creek (AMU Well Nos. 1 -5, 8, and 9) have been decommissioned due to their age and diminished performance. Well AMU-6, approximately 910 feet northeast of AMU-7, is slightly contaminated with PCE (approximately 5 µg/L or less). The presence of contamination in this well suggests the plume is at least 1,000 feet wide near the well field. AMU-6 is still used as a drinking water well and is pumped approximately 15 to 20 hours per day averaging 300 to 350 gallons per minute (gpm). Water from the nine active wells is initially blended and then treated. Prior to distribution, the water is treated primarily with liquid chlorine, used to disinfect the water, and fluorosilicic acid (H_2SiF_6), for water fluoridation. Hydrochloric acid is used for well maintenance and rehabilitation for removal of mineral scale.

2.3 WASTE CHARACTERISTICS AND POTENTIAL SOURCE AREAS

This section discusses waste characteristics and information known about potential source areas.

2.3.1 Waste Characteristics

Previous investigations in Atlantic indicate PCE and TCE are the predominant contaminants present at concentrations exceeding health-based benchmarks.

2.3.1.1 Tetrachloroethene

PCE is a chlorinated solvent with an ether-like odor, typically used in dry cleaning operations and as a degreaser for metal parts (Agency for Toxic Substances and Disease Registry [ATSDR] 1997). PCE is denser than water and tends to be at greater depths with increasing distance from the source area.

PCE was introduced as a dry cleaning solvent in 1934, and by 1948 had replaced carbon tetrachloride as the major chlorinated dry cleaning solvent used in the United States (petroleum solvents still dominated overall). By 1962, dry cleaning operations accounted for 90 percent of the PCE used in the United States. At one time, PCE had been mixed with grain protectants and certain liquid grain fumigants, but this was no longer approved by 1980 (Meister Publishing Company [Meister] 1980). PCE degrades to TCE.

2.3.1.2 Trichloroethene

TCE is a nonflammable, colorless liquid with a somewhat sweet odor and a sweet, burning taste (ATSDR 2003). It is used mainly as a solvent to remove grease from metal parts, and is an ingredient in adhesives, paint removers, typewriter correction fluids, and spot removers. TCE is denser than water and is typically found at greater depths with increased time or distance from the source area. TCE is reasonably anticipated to be a human carcinogen. Drinking small amounts of TCE for long periods may cause liver and kidney damage, impaired immune system function, and impaired fetal development in pregnant women (ATSDR 2003). The cis- and trans- isomers of 1,2-DCE are common degradation products from TCE.

2.3.2 Source Area

This section summarizes information on potential sources identified from previous investigation. The source of contamination at this site is contaminated soils identified in samples collected in 2002 at 1205 East 7th Street (see Appendix A, Figure 2). A former dry cleaning facility, the Norge Dry Cleaning Village, operated at this location during the 1960s, and from about 1974 to 1986, IDOT leased the site as a materials testing laboratory. It is suspected that the dry cleaning operations and IDOT routinely used solvents (E&E 1988).

2.4 REGULATORY INVOLVEMENT

A summary of involvement and investigations by Iowa Department of Natural Resources (IDNR) and EPA is as follows.

During a water quality survey by the IDNR in August 1982, PCE was detected in the AMU water supply well AMU-7 at a concentration of 170 μg/L. Subsequent IDNR sampling detected PCE in AMU- 7 at concentrations ranging from 11 μg/L in March 1995 (IDNR 1999) to 260 μg/L in August 1984 (E&E 1988). From August 1982 to November 1987, water from AMU-7 was pumped at 80 gpm to Buttermilk Creek, an intermittent tributary of Troublesome Creek, in an attempt to restrict migration of the PCE contamination to other nearby drinking water supply wells (E&E 1988). In December 1987, the discharge from AMU- 7 to Buttermilk Creek was rerouted to the 3rd Street sanitary sewer line, about 150 feet southwest of the well, for treatment at the City of Atlantic's wastewater treatment facility (E&E 1988).

In August 1987, an EPA contractor did a soil gas survey to delineate the approximate extent of PCE contamination. Soil-gas samples were collected from 5 to 6 feet bgs at 55 locations, beginning at the former dry cleaning and IDOT laboratory facility, and proceeding in the direction of groundwater flow (north-northwest) toward the AMU well field. Analytical results suggested the source area was just south of East 7th Street, about 250 feet east of the former dry cleaning and IDOT laboratory (E&E 1988) . The report stated that a release of PCE likely occurred at the former dry cleaning and IDOT laboratory, and migrated through surface runoff and groundwater flow to this topographic low near the former location of a Hardee's restaurant. According to the report, the migration of PCE from the source area may have followed the storm sewer system along the southern side of East 7th Street (E&E 1988). In 1988, the EPA assessed the site using the first HRS model. Two pathways were scored (groundwater and surface water) to obtain an overall site score of 26.14. The groundwater migration pathway scored 44.90 using the old HRS model.

In August and November 1998, IDNR conducted follow-up investigations of the PCE contamination to better define the source. During these investigations, 34 soil gas samples and 10 soil samples were collected for analysis. The soil samples were analyzed by IDNR for PCE by a mobile laboratory using a headspace analysis method. The sampling focused on the area of the former dry cleaning and IDOT laboratory, and the source area identified during the 1987 investigation by E&E. Soil gas data from the IDNR investigations confirmed the level of PCE contamination originally detected near a former Hardee's restaurant (currently Burger King). However, significantly higher PCE levels (greater than

10,000 parts per million) were detected in soil gas near the former dry cleaning and IDOT laboratory. Based on these findings, IDNR concluded that the silty clayey soil beneath the former dry cleaning and IDOT laboratory is the predominant source of PCE contamination impacting the groundwater (IDNR 1999). The report indicated that soils appeared to be contaminated to at least 20 feet bgs. The report also recommended installing monitoring wells to better define the extent of PCE contamination in groundwater near the suspected source area.

From 2002 through 2004, Tetra Tech START conducted a removal site evaluation of the Atlantic Water Supply site. Field activities included advancement of 13 soil borings to depths ranging from 23 to 36 feet bgs, and installation of three monitoring wells (Tetra Tech 2004). The soil borings were advanced around the previously identified source area and sampled to aid in determining the extent of contamination (see Appendix A, Figure 2). PCE was identified in soil from Geoprobe borings GP-1 and GP-4 and soil from monitoring well boring MW-2. All these samples were collected in an asphalt parking lot east of the former dry cleaning facility.

In samples from Geoprobe location GP-1, PCE was detected at 9 to 10 and 21 to 22 feet bgs at concentrations of 23 and 37 micrograms per kilogram (µg/kg) respectively. In GP-4, PCE was reported at 32 µg/kg in a sample collected 34.5 to 35 feet bgs. Soil samples collected from the boring at MW-2 contained much higher concentrations of PCE. Four samples were collected from this boring at 9, 19, 28 and 36 feet bgs. PCE was detected in all four samples with concentrations ranging from an estimated 930 to 5,200 µg/kg. At the boring for MW-2, concentrations increased with depth. Based on the locations showing PCE detections, an approximately 2,100-foot square area of contaminated soil was documented. Contamination is thickest in the vicinity of MW-2 where it was identified between 9 and 36 feet bgs. The concentration and thickness decreases in GP-1 and GP-4 to the south and southeast. The total known volume, based on these samples is approximately 658.8 cubic yards.

In September 2002, three permanent, flush-mounted monitoring wells (MW) were installed into the Dakota sandstone formation, from 40.5 to 50 feet bgs, to assess groundwater quality near the source area. All wells were flush-mounted surface completion and were constructed of 2-inch inside diameter, schedule 40 polyvinyl chloride (PVC) riser and screen. Each well had a 15-foot-long screen. Table 1 has additional details about the installed monitoring wells.

TABLE 1

MONITORING WELL LOCATIONS AND DEPTHS
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA

Monitoring Well	Well Location		Well Depth (ft btoc)	Approximate Elevation	Screened Interval (ft btoc)
	Latitude	Longitude			
MW-1	41.40370°	-94.99432°	44.65	1,187	29.4 – 44.4
MW-2	41.40375°	-94.99576°	49.37	1,191	34.1 – 49.1
MW-3	41.40496°	-94.99445°	39.12	1,177	23.7 – 38.7

Notes:

ft btoc Feet below top of casing
MW Monitoring well

In soils, PCE was reported at its highest concentrations near MW-2, installed near the former dry cleaner. At this location, PCE was found at a concentration above the regional screening level (RSL) of 2,600 μg/kg for industrial soil in samples collected from 19 to 36 feet bgs. This was the only soil boring with PCE levels above the RSL. Of the three monitoring wells installed, MW-2 was the only one containing PCE in groundwater at concentrations greater than 1 μg/L. PCE was reported at a maximum concentration of 5,300 μg/L in this well in July 2003 (Tetra Tech 2004).

In 2005, the EPA Environmental Response Team (ERT) and the Response Engineering and Analytical Contract (REAC) did a hydrogeologic investigation at the site (Lockheed Martin Technology Services [Lockheed Martin] 2005). The purpose of the investigation was to define the nature and extent of groundwater contamination upgradient of the municipal well field to assess the applicability of installing a permeable reactive barrier (PRB) for groundwater treatment and protection. As part of the investigation, six boreholes were installed about 150 feet upgradient (south) of contaminated well AMU-7 at the approximate centerline of the proposed PRB wall (see Appendix A, Figure 2). Borehole depths ranged from 76 to 87.5 feet bgs, and were installed into the upper sandstone bedrock using sonic drilling techniques.

Multiple groundwater samples were collected at each boring, beginning at about 20 to 25 feet bgs, and then at 20-foot intervals as the borings were advanced. Twenty-eight groundwater samples were collected. PCE was reported in water samples from all six borings, with the highest concentration (446 μg/L) in the boring (B-5) farthest east (Lockheed Martin 2005). In addition to PCE, the breakdown product TCE was detected in groundwater samples from each boring at concentrations as high as 21.3 μg/L. The eastern extent of the plume near the well field was not delineated in that investigation,

and remains undefined. Following the investigation, preliminary cost estimates to install a PRB were calculated. The total costs for this remedial technology were prohibitive to implement under the removal program.

In 2004, the AMU began monthly sampling of AMU-6, AMU-7, and the finished water from the water treatment plant. Samples were collected by the AMU and analyzed at the University of Iowa State Hygienic Laboratory for volatile organic compounds (VOC) by EPA method 524.2. In AMU-6, which currently produces water for the municipal well system, PCE and 1,2-dichloroethane (1,2-DCA) have been reported. PCE was identified in the well 73 percent of the time with concentrations reported below the 0.5 µg/L quantitation limit to 2.6 µg/L. The Superfund Chemical Data Matrix (SCDM) cancer risk screening concentration for PCE is 1.6 µg/L (EPA 2004). This concentration was exceeded eight times since June 2004. 1,2-DCA was identified 6 times, each time at concentrations below 1 µg/L. Since January 2004, PCE has not been detected in the samples from the finished water. PCE and TCE have been reported in AMU-7, which pumps to the waste water treatment plant. PCE was measured at a maximum concentration of 260 µg/L in August 1984 and appears to be gradually decreasing in concentration. In July 2011, the concentration was 76 µg/L. In AMU-7, TCE has never been reported at a concentration above 1.7 µg/L.

3.0 INVESTIGATION EFFORTS

Section 3.0 discusses the current site reassessment field sampling and associated quality assurance (QA)/quality control (QC) activities. The general objective of the site reassessment was to evaluate current condition of groundwater at the source and at the city well field.

A site reconnaissance was conducted in October 2011 to assess the presence and condition of installed monitoring wells and to discuss the project with AMU Director of Water Operations Jon Martens. START team members [redacted] and [redacted] did groundwater sampling at AMU wells and previously installed monitoring wells on December 12 through 14, 2011. The City of Atlantic provided verbal access permission to sample city wells. These activities were conducted under a site-specific Quality Assurance Project Plan (QAPP) for SI activities developed by Tetra Tech START, submitted to the EPA on October 25, 2011, and approved November 9, 2011 (Tetra Tech 2011).

Photographs documenting site activities are in Appendix B. Sampling-related activities were recorded in a site logbook, (see Appendix C). Samples collected under ASR 5613 were hand-delivered by START to the EPA Region 7 laboratory in Kansas City, Kansas, on December 15, 2011. The field sheets and chain-of-custody records are in Appendix D. Standard turnaround times were requested for all samples.

To ensure the credibility of sample collection, preparation and shipment, and analytical data, QA/QC sampling for the project was done according to protocols approved by the EPA Region 7 for work at hazardous waste sites, in accordance with the site-specific QAPP submitted to the EPA Region 7 in October 2011. The QAPP was followed during field sampling with two exceptions. A rinsate blank was not collected from sampling equipment because START used disposable bailers to purge and sample wells, therefore eliminating the need to conduct equipment decontamination between samples. The QAPP specified that a field duplicate sample be collected from AMU-6, but the field duplicate was collected from AMU-7 instead. Tetra Tech START received the analytical results for ASR 5613 in January 2012, with data validation completed by the EPA Region 7 laboratory.

For interpreting all analytical results, and as a guideline for determining significant matrix contaminant levels, sample results were compared to applicable health-based benchmarks in the SCDM (EPA 2004) and the EPA Regional Screening Levels (RSL) (EPA 2011). Analytical data for ASR 5613 are in Appendix E.

The groundwater migration pathway evaluation included sampling drinking water at nine active municipal wells (AMU-6 and AMU-10 through AMU-17), one former municipal well currently used to contain the plume (AMU-7), and three permanent monitoring wells (MW-1, MW-2, and MW-3). Samples were submitted to the EPA Region 7 Laboratory for analysis. Municipal well samples were submitted for analysis for drinking water level VOCs by the EPA Region 7 SOP 3230.09. Water samples from monitoring wells were submitted for analysis for low-level VOCs in an aqueous matrix by the EPA Region 7 SOP 3230.13. Groundwater sample locations are shown on Figure 3 in Appendix A.
A summary of the samples collected in Table 2.

TABLE 2

MONITORING AND MUNICIPAL WELL SAMPLE SUMMARY
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA

Well Number	Well Location		Sample Date	Sample Time	EPA Sample Identification
	Latitude	Longitude			
MW-1	41.40370°	-94.99432°	12-12-11	1545	5613-101
MW-2	41.40375°	-94.99576°	12-14-11	1259	5613-103
MW-2 (Duplicate)	41.40375°	-94.99576°	12-14-11	1259	5613-103FD
MW-3	41.40496°	-94.99445°	12-13-11	1540	5613-
AMU-6	41.41066°	-94.99767°	12-13-11	1252	5613-10
AMU-7	41.49811°	-94.96871°	12-13-11	0941	5613-1
AMU-7 (Duplicate)	41.49811°	-94.96871°	12-13-11	0941	5613-1FD
AMU-10	41.41080°	-94.99516°	12-13-11	1121	5613-5
AMU-11	41.41173°	-94.99313°	12-13-11	1106	5613-4

TABLE 2 (Continued)

MONITORING AND MUNICIPAL WELL SAMPLE SUMMARY
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA

Well Number	Well Location		Sample Date	Sample Time	EPA Sample Identification
	Latitude	Longitude			
AMU-12	41.41273°	-94.99156°	12-13-11	1209	5613-7
AMU-13	41.415333°	-94.99300°	12-13-11	1051	5613-3
AMU-14	41.41706°	-94.99096°	12-13-11	1242	5613-9
AMU-15	41.41487°	-94.98976°	12-13-11	1226	5613-8
AMU-16	41.41625°	-94.99625°	12-13-11	1024	5613-2
AMU-17	41.41366°	-94.99455°	12-13-11	1144	5613-6
Field Blank	NA	NA	12-13-11	1256	5613-12FB
Trip Blank	NA	NA	12-07-11	0643	5613-11FB
Field Blank	NA	NA	12-14-11	1330	5613-107FB
Trip Blank	NA	NA	12-07-11	0646	5613-105FB

Notes:

AMU Atlantic Municipal Utilities
EPA U.S. Environmental Protection Agency
FB Field blank
FD Field duplicate
MW Monitoring well
NA Not applicable

Municipal wells were sampled for the Atlantic Water Supply site reassessment. At each sampled well, the well pump was activated, and water pumped for about 5 minutes before a sample was collected from a spigot in the pump house. Periodic reading of pH, temperature, and conductivity were taken and recorded on the field sheets during the purge to ensure stabilization. After parameters had stabilized, samples were collected. Municipal well samples were collected into three 40-mL vials and preserved with hydrochloric acid (HCl) for analysis for drinking water level VOCs. All samples were stored in coolers maintained at or below 4°C pending submittal to the EPA Region 7 laboratory.

Groundwater samples were collected from monitoring wells MW-1, MW-2, and MW-3. The flush-mounted metal protective vault for MW-2 was damaged (cracked in half below the surface), rendering it ineffective in keeping surface materials from collecting within. All of the wells had locking J-plug well caps. Wells were hand-bailed, using disposable PVC bailers, until three well casing volumes were removed and the field parameters (temperature, pH, and specific conductivity) had stabilized. Samples were collected into four 40-mL vials, preserved with HCl, and submitted for VOC analysis at low detection limits by the EPA Region 7 laboratory. Purge water at wells MW-1 and MW-3 was dumped on the pavement and allowed to evaporate. Purge water from MW-2 was containerized and disposed of at

the Atlantic waste water treatment facility. Monitoring well purging information is on the sample field sheets in Appendix D.

Analytical Data Summary

Table 3 has a summary of the VOCs detected in samples from the three monitoring wells, nine active water supply wells, and the one former municipal well that is pumped to waste. All samples submitted to the EPA Region 7 Laboratory are included on this table; however, only contaminants reported in one or more samples are included in the table. The complete data package is in Appendix E.

No contaminants were detected in the trip or field blanks that accompanied samples to the laboratory.

PCE and its degradation products TCE or *cis*-1,2-DCE were detected in groundwater samples from monitoring wells near the source of contamination and in municipal wells downgradient of the source. Of the three monitoring wells sampled, contaminants were only detected in monitoring well MW-2. PCE was detected at a concentration of 2,500 µg/L (2,400 µg/L in the duplicate). In the samples from MW-2, *cis*-1,2-DCE was detected at a concentration of 3.7 µg/L (3.8 µg/L in the duplicate).

At AMU-7, currently pumping to waste, PCE was detected at a concentration of 87 µg/L (87 µg/L in the duplicate). TCE was reported in the samples from AMU-7 at a concentration of 1.3 µg/L (1.3 µg/L in the duplicate). Of the other active municipal wells sampled, the only one to contain any contaminants was AMU-6, with PCE reported at 3.6 µg/L. AMU-6 is approximately 950 feet northeast of AMU-7. No VOCs were reported in any other active municipal well sampled.

The presence of low concentrations of TCE and *cis*-1,2-DCE in the PCE plume may be evidence of reductive dechlorination through microbial degradation.

PCE was reported at concentrations above the 1.6 µg/L CR benchmark screening concentration from SCDM in samples from on-site monitoring well MW-2, the former municipal well AMU-7, and the active municipal well AMU-6. The MCL for PCE was exceeded in MW-2 and AMU-7. TCE concentrations detected in AMU-7 also exceeded the 0.21 µg/L CR benchmark screening level.

TABLE 3

VOLATILE ORGANIC COMPOUNDS IN MONOITORING AND MUNICIPAL WELL SAMPLES
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA

Well Identification	EPA Sample Identification Number	Contaminant (all results are in micrograms per liter [µg/L])		
		Tetrachloroethene (PCE)	Trichloroethene (TCE)	*cis*-1,2-Dichloroethene (*cis*-1,2-DCE)
Monitoring Wells				
MW-1	5613-101	1.0 U	1.0 U	1.0 U
MW-2	5613-103	**2,500**	1.0 U	3.7
MW-2 (Dup.)	5613-103FD	**2,400**	1.0 U	3.8
MW-3	5613-102	1.0 U	1.0 U	1.0 U
Municipal Wells				
AMU-6	5613-10	**3.6**	0.50 U	0.50 U
AMU-7	5613-1	**87**	**1.3**	0.50 U
AMU-7 (Dup.)	5613-1FD	**87**	**1.3**	0.50 U
AMU-10	5613-5	0.50 U	0.50 U	0.50 U
AMU-11	5613-4	0.50 U	0.50 U	0.50 U
AMU-12	5613-7	0.50 U	0.50 U	0.50 U
AMU-13	5613-3	0.50 U	0.50 U	0.50 U
AMU-14	5613-9	0.50 U	0.50 U	0.50 U
AMU-15	5613-8	0.50 U	0.50 U	0.50 U
AMU-16	5613-2	0.50 U	0.50 U	0.50 U
AMU-17	5613-6	0.50 U	0.50 U	0.50 U
Quality Assurance / Quality Control Samples				
Field Blank	5613-12FB	0.50 U	0.50 U	0.50 U
Trip Blank	5613-11FB	0.50 U	0.50 U	0.50 U
Field Blank	5613-107FB	1.0 U	1.0 U	1.0 U
Trip Blank	5613-105FB	1.0 U	1.0 U	1.0 U
Benchmarks				
Maximum Contaminant Level		5	5	70
SCDM Reference Dose Screening Concentration		360	11	360
SCDM Cancer Risk Screening Concentration		1.6	0.21	NE

Notes:

Bold value indicates a concentration that exceeds a benchmark value.

Shaded value indicates a concentration that exceeds the EPA MCL.

AMU	Atlantic Municipal Utilities	MW	Monitoring well
Dup.	Duplicate	NE	Not established
EPA	U.S. Environmental Protection Agency	SCDM	Superfund Chemical Data Matrix (EPA 2004)
FB	Field blank	U	The analyte was not detected at or above the reporting limit
FD	Field duplicate		

4.0 HAZARD RANKING SYSTEM FACTORS

This section discusses the sources of contamination and the various contaminant migration pathways evaluated under the HRS.

4.1 SOURCES OF CONTAMINATION

Groundwater samples were collected during the site reassessment to assess current conditions of VOC contamination identified during previous investigations. Soil samples were not collected because past sampling in 2002 adequately defined a source of contamination. The source of contamination at this site is contaminated soils as identified by soil gas in 1988, and confirmed by soil samples in 2002. PCE was identified in soil samples from Geoprobe borings GP-1 and GP-4 and monitoring well boring MW-2, in a parking lot east of the former dry cleaning/IDOT facility at 1205 East 7th Street.

PCE was detected at 9 to 10 and 21 to 22 feet bgs in GP-1 at concentrations of 23 and 37 µg/kg, respectively. PCE was reported at 32 µg/kg in a sample collected 34.5 to 35 feet bgs at GP-4. PCE concentrations later detected in soil samples from the boring at MW-2 were much higher. Four samples were collected from this boring at 9, 19, 28 and 36 feet bgs, with concentrations increasing with depth from an estimated 930 to 5,200 µg/kg. Based on the locations showing PCE detections, an approximately 2,100-square foot area of contaminated soil is documented. The contaminated soil zone is thickest near MW-2, PCE was identified between 9 and 36 feet bgs. The PCE concentrations and thickness decrease in GP-1 and GP-4 to the south and southeast. The total known volume, based on these samples, is approximately 658.8 cubic yards. The actual amount of contaminated soil may be greater as the area was not fully delineated to the north due to a road.

4.2 GROUNDWATER PATHWAY

Section 4.2 discusses the hydrogeologic setting, groundwater targets, and conclusions drawn from analytical results of groundwater samples. During the site reassessment, START collected groundwater samples from three monitoring wells, nine active municipal wells, and one former municipal well that now pumps continuously to contain the groundwater plume.

4.2.1 Hydrogeological Setting

Sources of groundwater in the area of Cass County include alluvial valley aquifers, glacial-drift aquifers, and the Dakota Formation (U.S. Geological Survey [USGS] 1992). The alluvial aquifers are primarily made up of deposits along existing river valleys. The nearest alluvial valley to Atlantic is the east fork of

the Nishnabotna River and its tributary, Troublesome Creek. The aquifer underlying the valley is relatively shallow, at an average depth of 21 feet, and is composed of fine-grained alluvial deposits. The thickness ranges from approximately 2 to 43 feet. Groundwater can also be obtained from shallow glacial-drift aquifers consisting of glacial and loess deposits over bedrock. In the Atlantic area, these deposits range in thickness from 18 to 260 feet. Although the water table is usually shallow, production rates in the glacial-drift aquifers are often limited due to low soil permeability. Neither the alluvial nor the glacial drift aquifers are used for groundwater production in the Atlantic area.

The City of Atlantic draws its water solely from the Nishnabotna Member of the Dakota Formation. The Dakota is a fine- to coarse-grained sandstone, very poorly cemented (friable), part pebbly to conglomeratic, and locally interbedded with seams of clay (IDNR 1996). Secondary lithologies include chert-quartz gravel, conglomerate, and gray to variegated mudstone with some siderite pellets. At the former drycleaner, the Dakota formation is about 35 feet below grade. The formation is approximately 40 to 60 feet thick in the Atlantic wellhead protection area, providing abundant pore space for groundwater storage. In the wellhead protection area, the Dakota is upwardly confined by clay-rich glacial till.

The aquifer is recharged by downward percolation through Pleistocene deposits and by lateral groundwater inflow from southwest Minnesota. Regional groundwater flow is from north to south, and natural discharge from the aquifer occurs into the lower reaches of major rivers in the region. Locally, groundwater flows from south to north (the direction of PCE migration) from a combination of topography and groundwater pumping from the municipal well field.

Average hydraulic characteristics of the Dakota Formation in the wellhead protection area are (USGS 1992):

- Transmissivity = 1,750 to 3,075 square feet per day
- Hydraulic conductivity = 35 to 60 feet per day
- Hydraulic gradient = 0.003 foot per foot.

Below the Dakota is an aquiclude of impermeable, calcareous, gray-blue-red shales, with interbedded limestones, belonging to the Missourian Series of Pennsylvanian age. These shales are encountered at 85 to 90 feet bgs and are approximately 725 feet thick in the Atlantic area.

4.2.2 Groundwater Targets

The 2010 census population for the city of Atlantic is 7,112. Cass County has an average of 2.18 persons per household (U.S. Census Bureau 2012). The entire city well field is within one mile of the contaminated soil associated with the former dry cleaner; two of the wells are within 0.5 mile. According to a December 2009 inspection of the Atlantic Municipal Utilities by the State of Iowa, the system has 3,336 service connections, including 87 outside the city limits, serving a total population of 7,475.

Eight municipal wells (AMU-10 through AMU-17) are on the north side of Troublesome Creek between 0.5 and 1 mile from the former dry cleaner site (see Appendix A, Figure 3). AMU-6 and AMU-7 are on the south side of the creek. Additional details about the wells are in Table 4. Other wells previously on the south side of the creek (AMU Wells 1-5, 8, and 9) have since been decommissioned due to their age and diminished performance. Well AMU- 6, approximately 910 feet northeast of AMU-7, is also slightly contaminated with PCE (approximately 5 μg/L or less). The well is still used as a drinking water well and is pumped approximately 15 to 20 hours per day at averaging 300 to 350 gpm. Sampling in December 2011 verified the historical results. The sample from this well contained PCE at 3.6 μg/L which is below the MCL of 5 μg/L, but above cancer risk screening concentrations.

TABLE 4

CITY OF ATLANTIC PUBLIC WATER SUPPLY WELLS
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA

Well Number	Well Record Number	Status	Year Constructed	Screened length (feet)	Construction Depth (feet bgs)	Static Water Level (feet bgs)
AMU-6	36160	Active	1966	30	80	28
AMU-7	1785	Pumped to waste	1942	25	82.8	unknown
AMU-10	36163	Active	1967	25	82.5	77
AMU-11	36164	Active	1973	30	86.3	78
AMU-12	36165	Active	1977	30	85.5	76
AMU-13	36167	Active	1991	30	98	42
AMU-14	36168	Active	1991	30	120	52
AMU-15	36169	Active	1991	30	92.5	28
AMU-16	36170	Active	1991	30	93.7	96
AMU-17	56000	Active	2002	30	75	95

Notes

AMU Atlantic Municipal Utilities
bgs Below ground surface

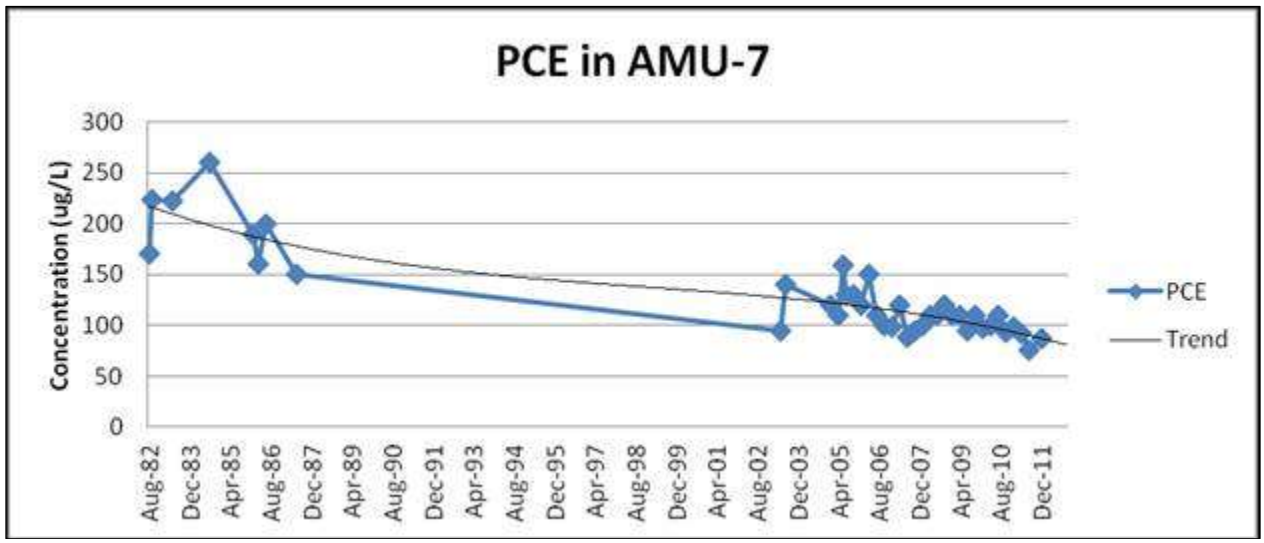
4.2.3 Groundwater Pathway Conclusions

PCE and its degradation products TCE and *cis*-1,2-DCE were detected in groundwater samples collected at and downgradient of the former drycleaners site. In December 2011, PCE was detected at a maximum concentration of 2,500 µg/L in the sample from MW-2 at the apparent source. Previous sampling of this well in July 2003 showed PCE at 5,300 µg/L. Low levels (3.8 µg/L) of *cis*-1,2-DCE were also reported in MW-2; however, TCE was not reported.

PCE and TCE were detected at 87 µg/L and 1.3 µg/L in AMU-7, which is currently pumped to waste to contain the plume. PCE was first detected in AMU-7 in August 1982 at a concentration of 170 µg/L. Concentrations have been as high as 260 µg/L in August 1984, but have been gradually decreasing over time as shown in Exhibit 1.

EXHIBIT 1

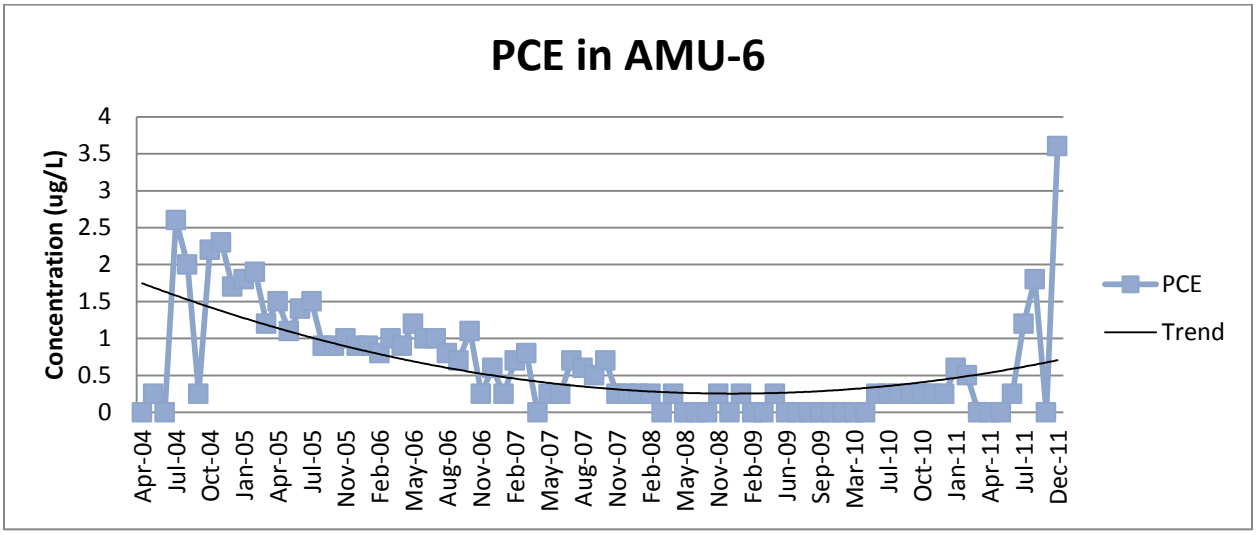
CONCENTRATIONS OF TETRACHLOROETHENE IN AMU-7
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA



In AMU-6, PCE was detected at 3.6 µg/L in December 2011. This concentration was higher than the recent results provided by the AMU, but even without this most recent sample it appears as if the concentration in AMU-6 is trending upward as shown in Exhibit 2.

EXHIBIT 2

CONCENTRATIONS OF TETRACHLOROETHENE IN AMU-6
ATLANTIC WATER SUPPLY SITE
ATLANTIC, IOWA



An objective of the reassessment was to determine the effectiveness of AMU-7 in containing the plume and to identify the need for repairs to the well. As illustrated in Exhibit 2, the entire plume is not contained by the pumping of AMU-7. Since 2004, samples collected from AMU-6 have exhibited low concentrations of PCE with concentrations trending upward since 2010. As shown in Figure 3 in Appendix A, AMU-6 is about 950 feet northeast of AMU-7 indicating that at least a portion of the plume is not being captured by the pumping well.

In 2005, the REAC contractor indicated that AMU-7 was in need of repair (Lockheed Martin 2005). It was reported that that the well appeared to be pulling in sand from either the filter pack or the surrounding formation. It was reported that the joint between the screen and casing has probably corroded. The well screen is positioned from approximately 46 to 83 feet bgs. Based on well data provided by AMU, the specific capacity of AMU-7 has declined from approximately 337.5 gpm in 1942 (when the well was first installed) to approximately 75 gpm in 2005. This suggests a problem with the well screen (i.e., clogging or degradation). Although acid is used to treat the well on a regular basis, this has not restored the well to its original condition (Lockheed Martin 2005). In 2011, the Director of Water Operations for the AMU had the 4-inch turbine pump in AMU-7 pulled and replaced with a 2-inch submersible pump that pumps 95 to 100 gpm on a continuous basis.

4.3 SURFACE WATER PATHWAY

The contaminated soil source for PCE is the former drycleaners, about 0.5 mile south of Troublesome Creek, the closest perennial stream. The normal annual precipitation in Cass County is 35.05 inches, and the average snowfall is about 25.3inches (USDA 2011). Any surface water at the site would likely flow to storm sewers or flow overland as sheetflow to the north and eventually enter Troublesome Creek. Because the contaminated soil source at the former drycleaners is covered by a concrete parking lot and is at depth, migration of contaminants through the surface water pathway is unlikely. This pathway was evaluated in 1988 because AMU-7 was at one time discharging to Buttermilk Creek, a tributary to Troublesome Creek. All discharge from AMU-7 is now directed to the wastewater treatment plant.

4.4 SOIL EXPOSURE AND AIR PATHWAY

The site is in the downtown area, which is largely covered with buildings and paved surfaces. No residences, day cares, or schools are in the immediate area. The contaminated soil at the former dry cleaners is covered by a cement parking lot. Direct exposure to the contaminated soil is unlikely unless the concrete is removed. The release potential to ambient air is low. There is the potential for vapor intrusion to indoor air between the source and AMU-7. A review of aerial photographs indicates that mobile homes are the primary residential building type in the contaminant flow path. The potential for vapor intrusion to these types of residences would be low as they do not rest on the ground surface. There are also slab-on-grade commercial structures closer to the source that may be susceptible to vapor intrusion. The closest residences to the former drycleaners were about 150 to 200 feet south-southwest (upgradient).

Ambient air samples were not collected during the site reassessment or any other stage of the investigation. Air samples could be collected in the future to evaluate the potential for vapor intrusion into nearby buildings.

5.0 EMERGENCY RESPONSE CONSIDERATIONS

The National Contingency Plan [40 *Code of Federal Regulations* 300.415(b)(2)] authorizes the EPA to consider emergency response actions at those sites posing an imminent threat to human health or the environment. Finished water samples are analyzed monthly by the AMU and have not detected PCE. Based on data, a referral to the EPA Region 7 for emergency response activities such as a time critical response action does not appear necessary.

PCE from a known source area continues to migrate to the municipal well field. One city well was taken off-line due to contamination. This well has been pumped to waste for more than 25 years. A second active municipal well is contaminated with PCE at concentrations below MCL but above health based benchmarks. A removal evaluation was completed in 2005 where several potential ex-situ and in-situ treatment technologies were discussed to reduce contaminant concentrations at the source.

6.0 SUMMARY

The municipal water supply well field in Atlantic, Iowa, has been impacted by PCE (Terra Tech 2004). At the source, a former dry cleaners or an IDOT laboratory, approximately 40 feet of silt and clay overlies fine- to coarse-grained friable sandstone from which the well field withdraws the City's potable water.

Currently, the PCE contamination continues to migrate down into the sandstone aquifer, and travel horizontally in this aquifer to the City's municipal well field. The well nearest to the source area (AMU-7) was first found to contain PCE in 1982 (reported at a concentration of 170 µg/L) (E&E 1988). AMU-7 was disconnected from the system and is currently being pumped continually to the AMU wastewater treatment plant to provide hydraulic control and protect nine other municipal wells from contamination. The well is showing signs of deterioration. Recent low level occurrence of PCE in AMU-6 (currently pumping to the system) indicates that the PCE plume is not fully contained by well AMU-7, and further deterioration of the well may acerbate the problem. Currently, nine active municipal serve the 7,475 citizens in and around Atlantic, Iowa. Eight municipal wells (AMU-10 through -17) are on the north side of Troublesome Creek between 0.5 and 1 mile from the former dry cleaner site.

In December 2011, START collected groundwater samples from three monitoring wells near the source. Groundwater samples were also collected from nine active municipal wells and a former municipal well (AMU-7) that is now pumped to waste to contain the plume. PCE (2,500 µg/L) and *cis*-1,2-DCE (3.8 µg/L) were identified in samples collected from MW-2 at the former cleaners at 1205 East 7th Street. In AMU-7, PCE and TCE were reported at 87 and 1.3 µg/L, respectively. Concentrations have decreased with time in both the monitoring well and at AMU-7 but remain well above health-based benchmarks.

START collected samples from all active municipal wells in the system. The only well to contain any site related contaminants is AMU-6 where PCE was reported at 3.6 µg/L. AMU-6 is approximately 950 feet northeast of AMU–7. PCE was reported at concentrations above the 1.6 µg/L CR benchmark screening concentration from SCDM in samples from on-site monitoring well MW-2, the former municipal well AMU-7, and the active municipal well AMU-6. The MCL for PCE was exceeded in MW-2 and AMU-7. TCE concentrations detected in AMU-7 also exceeded the 0.21 µg/L CR benchmark screening level.

7.0 REFERENCES

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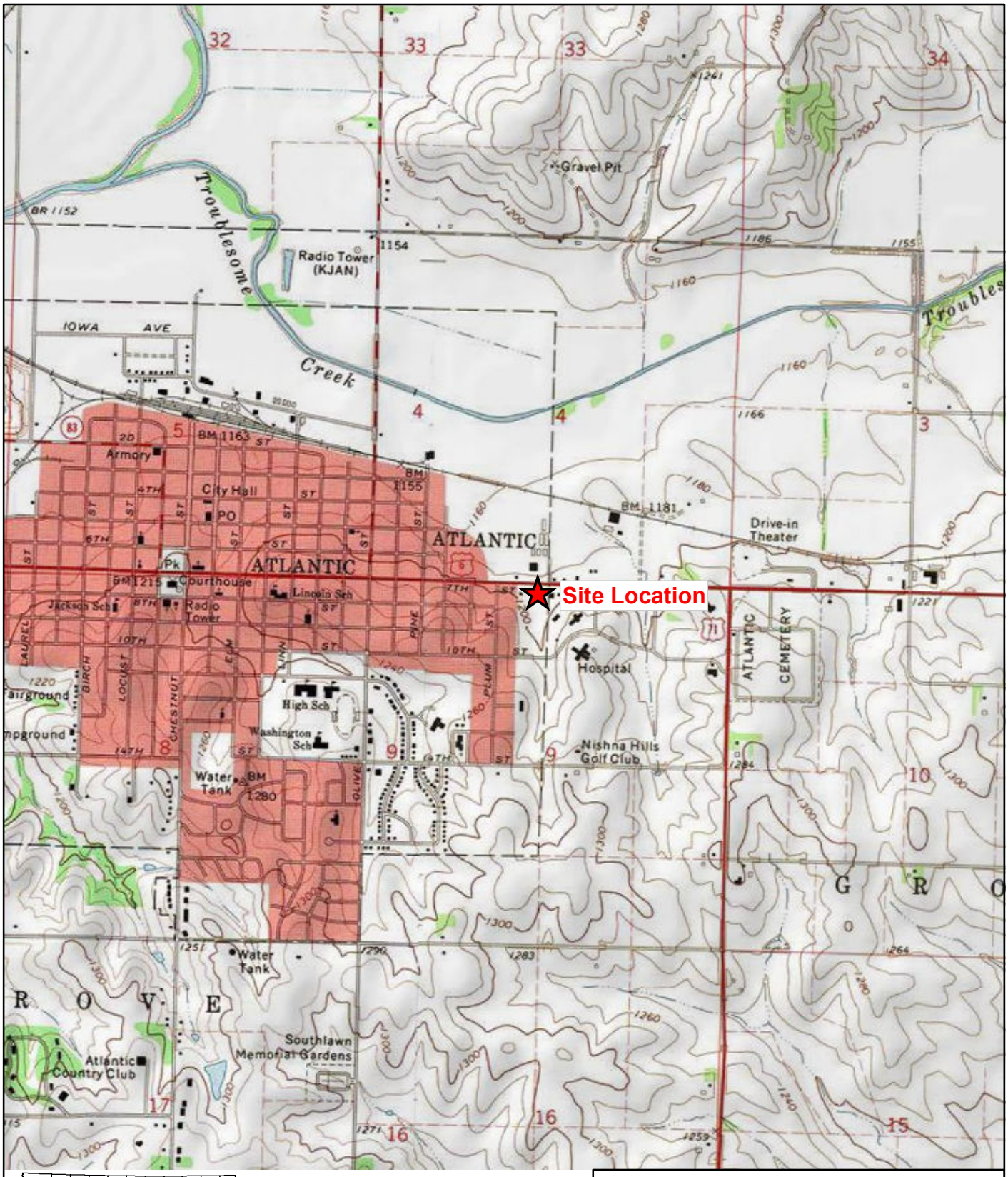
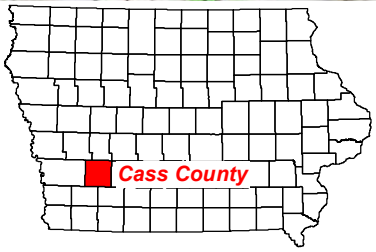
APPENDIX A

FIGURES





N

0 1,000 2,000

Feet

Source: USGS Atlantic, Iowa 7.5 Minute Topo Quad, 1991
USGS Wiota, Iowa 7.5 Minute Topo Quad, 1971

Atlantic Water Supply Site
Atlantic, Iowa

Figure 1
Site Location Map

TETRA TECH EM INC.

Date: 10/18/2011 Drawn By: Bill Spiking Project No: X9004.L.11.0258.000

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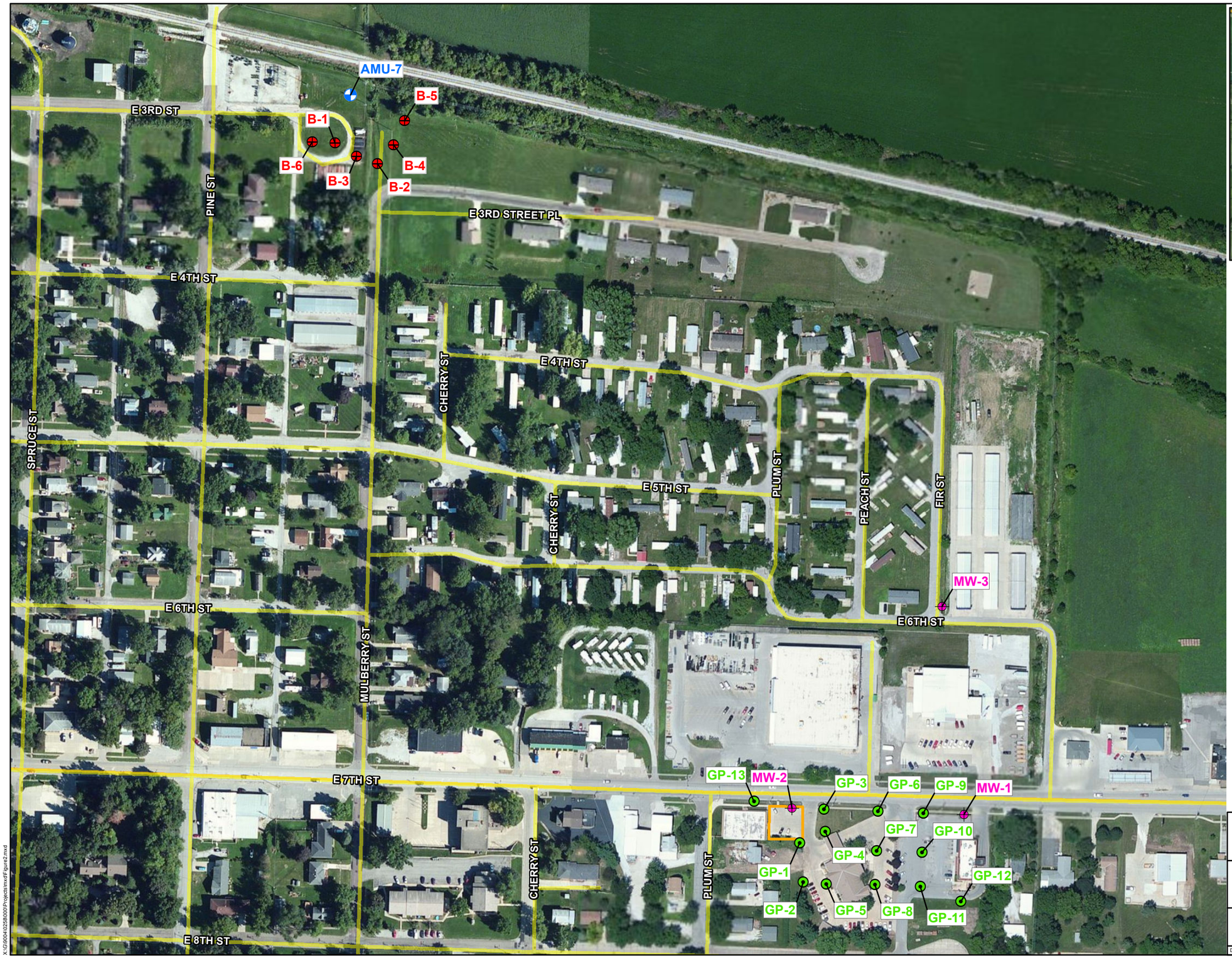
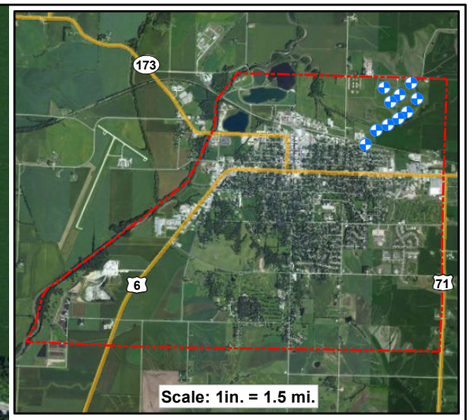




Legend

- Public water supply well location

2005 Sampling Event

- Borehole location

2002 Sampling Event

- Geoprobe® location
- Monitoring well location
- Major road
- Street
- Approximate location of former dry cleaner/ IDOT laboratory
- City boundary

N

0 105 210

Feet

Source: Bing Maps Aerial Imagery Web Mapping Service, 2011; HSIP Gold, 2007; Snyder and Associates, 4/4/99; U.S. EPA Environmental Response Team, Response Engineering and Analytical Contract, Figure 1, Atlantic Iowa Groundwater PCE, 2005.

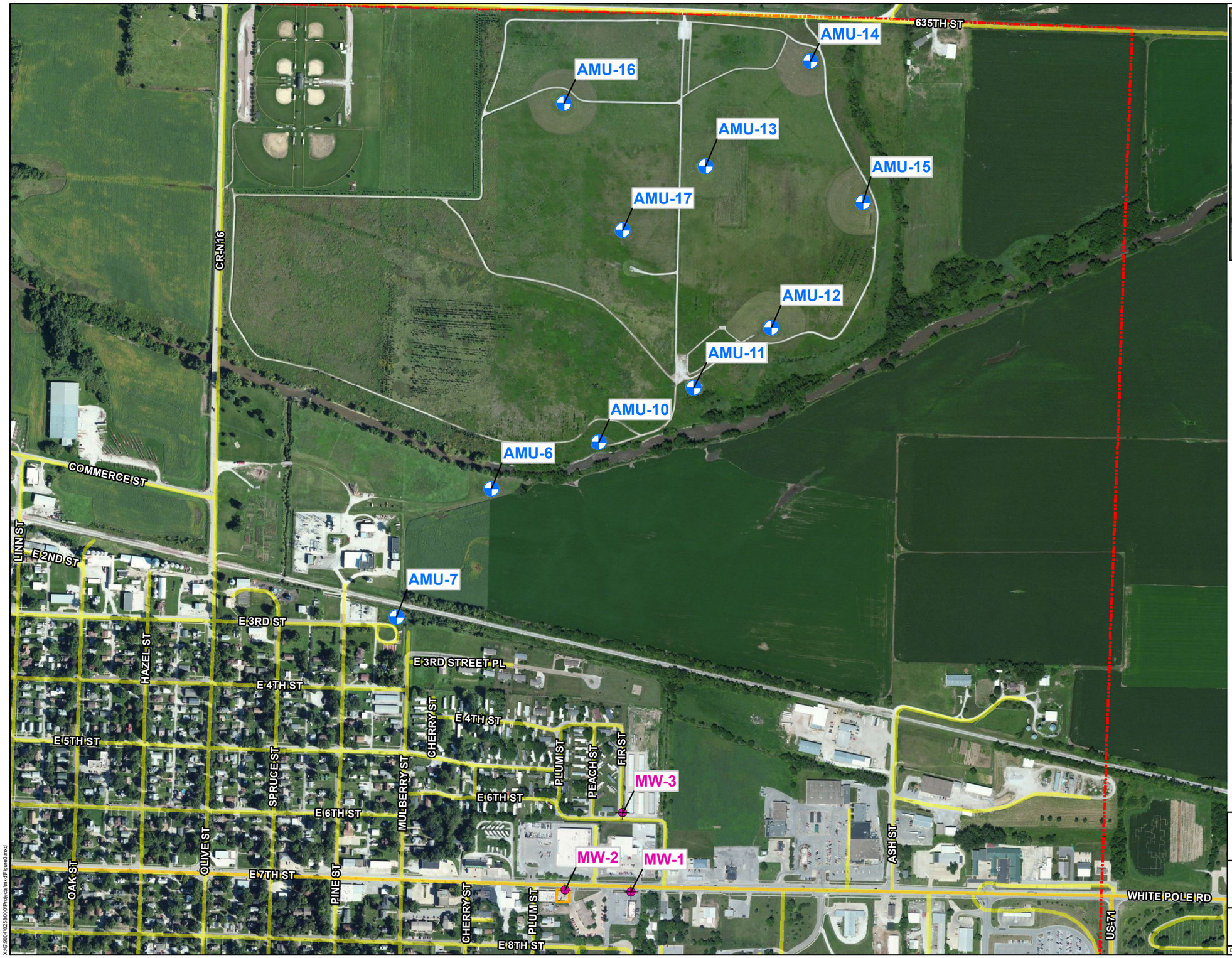
Atlantic Water Supply Site
Atlantic, Iowa

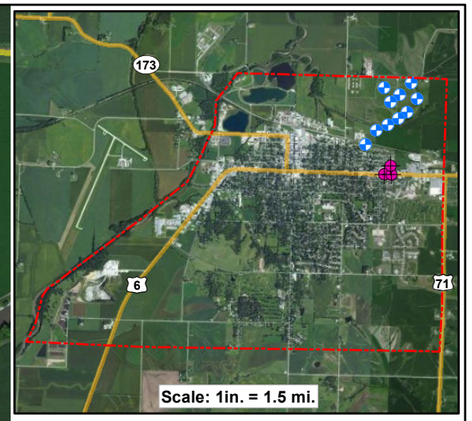
Figure 2
Previous Sampling Locations Map

TETRA TECH EM INC.

Date: 02/24/2012 Drawn By: Nick Wiederholt Project No: X9004.L.11.0258.000

X:\GIS\9004\0258\000\Projects\mxd\Figure2.mxd





Legend

Sample Locations

- Public water supply well location
- Monitoring well location
- Major road
- Street
- Approximate location of former dry cleaner/ IDOT laboratory
- City boundary

N

0 275 550

Feet

Source: Bing Maps Aerial Imagery Web Mapping Service, 2011

Atlantic Water Supply Site
Atlantic, Iowa

Figure 3
Sample Location Map

TETRA TECH EM INC.

Date: 02/24/2012 Drawn By: Bill Spiking Project No: X9004.L.11.0258.000

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APPENDIX B

PHOTOGRAPHIC LOG

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring well MW-2.	1
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: West	PHOTOGRAPHER	[redacted]	10/10/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring well MW-2. Notice how the protective steel casing has been broken and the well filled with sand and gravel.	2
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: down	PHOTOGRAPHER	[redacted]	10/10/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring well MW-1. Note that the well was covered in asphalt and could not be opened during the site reconnaissance.	3
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: Down	PHOTOGRAPHER	[redacted]	10/10/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring well MW-3. Well is in good condition.	4
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: Down	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Utilities Building	5
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: North	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-7.	6
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: Northeast	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-7.	7
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: N/A	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-7.	8
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: West	PHOTOGRAPHER	[redacted]	

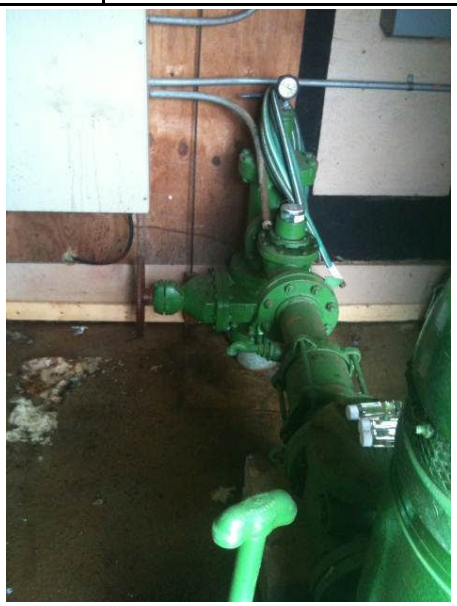
Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-10.	9
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO.	DESCRIPTION	Atlantic Municipal Well AMU-10.	10
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-11.	11
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11



TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-11.	12
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-12.	13
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: South	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-12.	14
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction:	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-13.	15
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: West	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-13.	16
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction:	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-14.	17
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: South	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-14.	18
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: South	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-15.	19
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-15.	20
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well House AMU-16.	21
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-16.	22
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well Manhole AMU-17.	23
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: South	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Atlantic Municipal Well AMU-17.	24
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: N/A	PHOTOGRAPHER	[redacted]	12/13/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring Well location MW-1.	25
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: South	PHOTOGRAPHER	[redacted]	12/12/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring Well MW-1.	6
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: N/A	PHOTOGRAPHER	[redacted]	12/12/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring Well location MW-2.	27
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	12/14/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring Well MW-2.	28
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: N/A	PHOTOGRAPHER	[redacted]	12/14/11

Atlantic Water Supply Site
Atlantic, Iowa

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring Well location MW-3.	29
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: West	PHOTOGRAPHER	[redacted]	12/13/11

TETRA TECH PROJECT NO. X9004.L.11.0258.000	DESCRIPTION	Monitoring Well MW-3.	30
	CLIENT	U. S. Environmental Protection Agency Region 7	Date
Direction: West	PHOTOGRAPHER	[redacted]	12/13/11

APPENDIX C

FIELD LOGBOOK

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Atlantic, IA
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CONTENTS

PAGE	REFERENCE	DATE

Atlantic Water Supply
9004.L.11.0258

Oct 10, 2011

1100 Leave KC office for Atlantic Iowa to meet with Jon Martens, the Director of Water Operations with the Atlantic Municipal Utilities.

Work to be performed at this site is a CERCLA site reassessment. E&E did work in late 1980s followed by IDNR in late 1990s. Site was evaluated with HRS (original) & did not score in 1989. Removal assessments were conducted in 2002-2006. As source of PCE has been found and the extent of GW contamination has been roughly delineated.

[redacted]

Atlantic Water Supply
9004.L.11.0258

Objective of this reassessment is to: 1) review existing files from EPA & the City of Atlantic; 2) Evaluate & sample existing monitoring wells; 3) Evaluate AMU well #7 effectiveness and any need for Repairs; 4) Prepare HRS scoring memorandum; and 5) Analyze the potential need for a removal action. Objectives for today are to assess condition of monitoring wells and gather information from city.

1230 Arrived in Atlantic & met w/ Jon Martens.

Discussed history of investigations to date & the purpose of this investigation.

I asked a little bit about the current system. Jon said there were nine municipal wells that pump to a blended

10-10-11 Atlantic Water Supply System. No single well produces more than 40% of the demand of the system. A wellhead protection area has been delineated - Jon gave me a copy of that report. He also did not know of any private wells w/in city limits. The city does not have complete copies of logs for all wells. Jon gave me sample results for well 6 & the finished water - tested monthly.

Well 7 packing is bad & sand & gravel are impacting pump. Pulled 4" turbine pump & replace w/ 2" submersable which pumps 15-100 gpm 24 hrs/day.

After meeted drove around to inspect wells. Cover on MW-2 is cracked & well was covered w/ sand/gravel. Took Photos. Well #1 could not be opened because it had been asphalted over - took pictures. Well 3 is OK and can be sampled.

1600 Left Atlantic - finished for Day

DWB

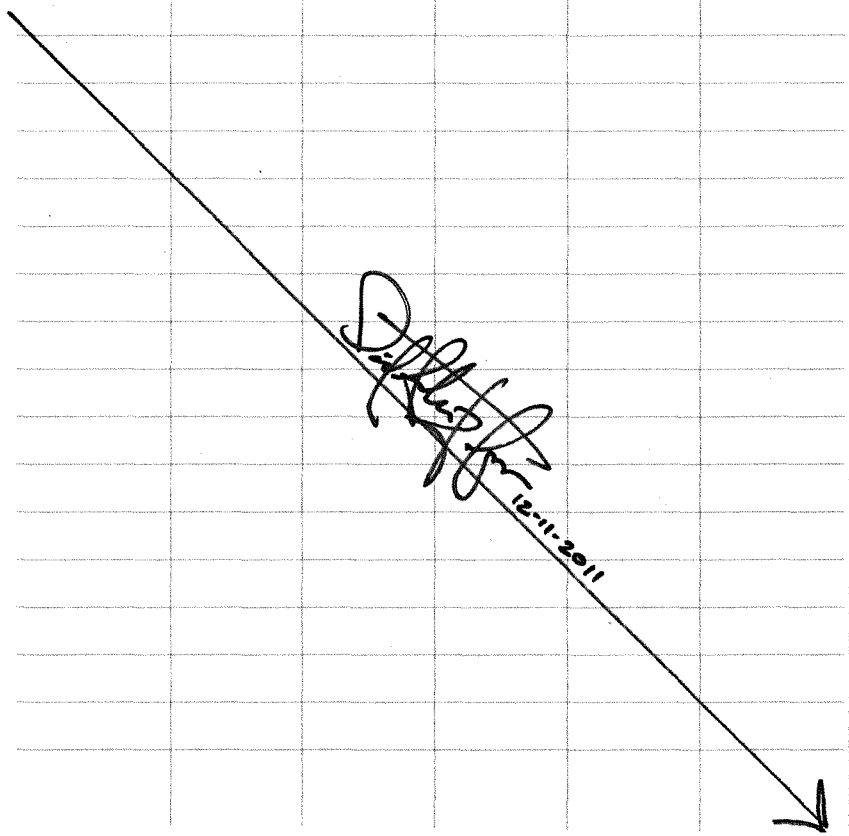
12/11/2011 ATLANTIC, IA GROUNDWATER SITE

1700 TETRA TECH FIELD TEAM OF [redacted] DEPART KANSAS CITY.

1945 TEAM ARRIVES IN ATLANTIC, IA. TEAM LOCATES THE TOWN HOSPITAL & SCOUTS OUT MONITORING WELL LOCATIONS / THE ATLANTIC MUNICIPAL UTILITY BUILDING.

2110 TEAM DEPARTS ATLANTIC, IA.

2156 TEAM ARRIVES @ THE HOTEL IN OMAHA, NE.



1400 WEATHER: CLOUDY 43°F WINDS @ 5 MPH HUMIDITY 70%

12/12/2011 ATLANTIC, IA GROUNDWATER SITE

0730 TETRA TECH FIELD TEAM [redacted] & [redacted] HAVE A TAILGATE MEETING IN THE PARKING LOT OF THE HOTEL IN OMAHA, NE TO DISCUSS THE DAY'S FIELD ACTIVITIES & SAFETY CONCERNS.

0815 TEAM DEPARTS OMAHA, NE.

0910 TEAM ARRIVES IN ATLANTIC, IA.

0930 TEAM STARTS TO LOCATE MW-1, MW-2, & MW-3.

1100 TEAM CALLS JOHN MARTENS, DIRECTOR OF WATER OPERATIONS IN ATLANTIC. WATKINS LEAVES A VOICEMAIL.

1130 TEAM ARRIVES @ THE ATLANTIC PUBLIC WORKS BUILDING TO TALK W/ JOHN MARTENS ABOUT SAMPLING MUNICIPAL WELLS. NOBODY IS PRESENT @ THE FACILITY.

1200 TEAM BREAKS FOR LUNCH.

1215 TEAM ARRIVES @ MONITORING WELL LOCATION MW-1. IT IS LOCATED IN THE NE CORNER OF THE BURGER KING PARKING LOT.

CONTACT INFO:

BURGER KING (712) 243-1954
1309 EAST 7TH STREET
ATLANTIC, IA 50022

12/12/2011 ATLANTIC, IA GROUNDWATER SITE

1230 TEAM CALIBRATES THE WATER QUALITY METER & THE PID.

1245 THE WELL COVER HAS BEEN PAVED OVER W/ ASPHALT. THE TEAM USES A CHISEL & HAMMER TO GAIN ACCESS TO THE WELL.

1430 TEAM FINALLY GETS THE COVER OFF THE WELL. TEAM CUTS THE LOCK OFF & PURGING/SAMPLING ACTIVITIES BEGIN.

NOTE: ALL SAMPLING/PURGING ACTIVITIES WERE CONDUCTED IN ACCORDANCE W/ THE QAPP FOR THIS PROJECT UNLESS NOTED IN THIS LOG BOOK.

PURGING/SAMPLING DETAILS:

LAT: 41.40370° LONG: -094.99432

DTW: 31.50' TOTAL DEPTH: 44.56'

VOLUME: 2.13 GAL PID = ND

NOTE: GROUNDWATER IS VERY TURBID.

WATER QUALITY:

TIME	GAL PURGED	TEMP	pH	CONDUCTIVITY
1435	2.5 GAL	12.98°C	7.05	562 µS/cm
1445	7.5	12.39	6.66	521
1456	12.5	12.68	6.58	538
1505	17.5	12.31	6.61	533
1520	22.5	12.53	6.77	530
1536	25.0	12.41	6.69	528

12/12/2011 ATLANTIC, IA GROUNDWATER SITE

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #	FD/MS/MSD
1545	5613-101	GW01	—

NOTE: 1-40mL VOA VIAL BROKE AFTER SAMPLING ACTIVITIES WERE COMPLETED.

1600 TEAM GOES TO THE HARDWARE STORE TO PURCHASE LOCKS FOR THE 3 PRIVATE MONITORING WELLS.

1630 TEAM PUTS A NEW LOCK ON WELL MW-1 & TAKES PICTURES OF THE SITE.

1645 IT IS TOO DARK TO CONTINUE FIELD ACTIVITIES. TEAM DEPARTS ATLANTIC GROUNDWATER SITE.

1709 TEAM ARRIVES @ THE WALMART IN ATLANTIC, IA TO PURCHASE ADDITIONAL FIELD SUPPLIES & ICE.

1750 TEAM DEPARTS ATLANTIC, IA.

1838 TEAM ARRIVES @ THE HOTEL.

12-12-2011

0930 WEATHER: CLOUDY 39°F WIND N @ 1 MPH HUMIDITY 81%

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

0730 TEAM HAS A TAILGATE MEETING @ THE HOTEL IN OMAHA, NE. TO DISCUSS SAFETY ISSUES FOR THE DAY'S FIELD ACTIVITIES.

0740 TEAM CALIBRATES THE WATER QUALITY METER & THE PID.

0800 TEAM DEPARTS THE HOTEL.

0900 TEAM ARRIVES IN ATLANTIC, IA @ THE ATLANTIC MUNICIPAL WORKS BUILDING (15 W. 3RD ST.) & MEETS W/ JOHN STEVENS, DIRECTOR OF WATER OPERATION. A PLAN FOR SAMPLING THE MUNICIPAL WELLS IS AGREED UPON & EVERYONE MOVES TO MUNICIPAL WELL # AML-7.

NOTE: ALL SAMPLING / PURGING ACTIVITIES WERE CONDUCTED IN ACCORDANCE W/ THE QAPP FOR THIS PROJECT UNLESS NOTED IN THIS LOG BOOK.

PURGING / SAMPLING DETAILS: LAT= 41.49811 LONG: -094.96871

TIME	TEMP	pH	CONDUCTIVITY
0920	12.51°C	7.27	609 µS/cm
0925	12.17	6.36	596
0930	12.13	6.11	596
0934	12.09	5.97	594
0938	11.95	5.94	592
0941	12.07	6.01	593

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
0941	5613-1	MGWΦ1
0941	5613-1-FD	MGWΦ1-FD

NOTE: THE CONTACT INFO FOR ALL MUNICIPAL WELLS SAMPLED IS:

JOHN MARTENS, DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD STREET BOX 517
ATLANTIC, IA 5ΦΦ22
(712) 243-1395

1000 TEAM MOVES TO MUNICIPAL WELL # AMU-16.

PURGING/SAMPLING DETAILS: LAT: 41.41625 LONG: -094.99625

TIME	TEMP	pH	CONDUCTIVITY
1014	10.46°C	6.13	285 µS/cm
1017	10.93	6.39	293
1020	11.00	6.50	293
1024	10.99	6.46	294

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1024	5613-2	MGWΦ2

1038 TEAM MOVES TO MUNICIPAL WELL # AMU-13.

PURGING/SAMPLING DETAILS: LAT: 41.415333 LONG: -094.99300

CONTINUED →

1120 WEATHER: CLOUDY 41°F WIND SSE @ 3 MPH HUMIDITY 81%

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

TIME	TEMP	pH	CONDUCTIVITY
1043	10.70°C	6.35	276 µS/cm
1046	10.76	6.40	282
1049	10.86	6.40	283
1051	10.87	6.41	283

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1051	5613-3	MGWΦ3

1054 TEAM MOVES TO MUNICIPAL WELL # AMU-11.

PURGING/SAMPLING DETAILS: LAT: 41.41173° LONG: -094.99313°

TIME	TEMP	pH	CONDUCTIVITY
1059	10.76°C	6.37	570 µS/cm
1101	10.76	6.40	574
1106	10.78	6.42	578

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1106	5613-4	MGWΦ4

1110 TEAM MOVES TO MUNICIPAL WELL # AMU-10.

PURGING/SAMPLING DETAILS: LAT: 41.41080° LONG: -094.99516°

TIME	TEMP	pH	CONDUCTIVITY
1113	11.80°C	6.60	383 µS/cm
1116	11.85	6.69	399
1121	11.88	6.61	393

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1121	5613-5	MGWΦ5

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

1128 TEAM MOVES TO MUNICIPAL WELL # AMU-17. THE WELL IS LOCATED IN A MANHOLE 10' BGS. JOHN MARTENS ATTACHES A HOSE TO THE WELL SPOUT SO THE TEAM DOES NOT HAVE TO ENTER THE CONFINED SPACE.

PURGING | SAMPLING DETAILS: LAT: 41.41366° LONG: -094.99455°

TIME	TEMP	pH	CONDUCTIVITY
1134	11.03°C	6.69	336 µS/cm
1138	11.09	6.58	337
1144	11.13	6.54	337

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #	NOTES
1144	5613-6	MGWΦ6	TRIPLE VOLUME COLLECTED FOR MS/MSD

1149 TEAM MOVES TO MUNICIPAL WELL # AMU-12.

PURGING | SAMPLING DETAILS: LAT: 41.41273° LONG: -094.99156°

TIME	TEMP	pH	CONDUCTIVITY
1159	10.90°C	6.50	378 µS/cm
1202	11.01	6.51	381
1209	11.05	6.51	382

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1209	5613-7	MGWΦ7

1213 TEAM MOVES TO MUNICIPAL WELL # AMU-15.

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

PURGING | SAMPLING DETAILS: LAT: 41.41487° LONG: -094.99876°

TIME	TEMP	pH	CONDUCTIVITY
1220	10.85°C	6.46	290 µS/cm
1224	11.00	6.47	288
1226	11.01	6.51	288

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1226	5613-8	MGWΦ8

1230 TEAM MOVES TO MUNICIPAL WELL # AMU-14.

PURGING | SAMPLING DETAILS: LAT: 41.41706° LONG: -094.99096°

TIME	TEMP	pH	CONDUCTIVITY
1235	10.97°C	6.30	279 µS/cm
1238	11.03	6.34	279
1242	11.07	6.38	279

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1242	5613-9	MGWΦ9

1243 TEAM MOVES TO MUNICIPAL WELL # AMU-6. THE WELL IS LOCATED IN A MANHOLE 10' BGS. JOHN MARTENS ATTACHES A HOSE TO THE WELL SPOUT SO THE TEAM DOES NOT HAVE TO ENTER THE CONFINED SPACE.

PURGING | SAMPLING DETAILS: LAT: 41.41006° LONG: -094.99767°

1400 WEATHER: CLOUDY 43°F WIND SSE @ 8MPH HUMIDITY 76%

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

TIME	TEMP	pH	CONDUCTIVITY
1245	11.26°C	6.62	391 µS/cm
1248	11.40	6.51	400
1252	11.47	6.48	398

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1252	5613-10	MGW1ϕ

1256 TEAM COLLECTS A FIELD BLANK SAMPLE.

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1256	5613-12-FB	MGW-FB

1320 TEAM MOVES TO MONITORING WELL MW-3. IT IS LOCATED JUST SW OF A SELF STORAGE COMPLEX ON A TRAILPARK PROPERTY SPACE.

CONTACT INFO:

JIM REISCHL (712) 243-5211

PO BOX 60

DUNLAP, IA 51529

1330 TEAM CUTS OFF THE LOCK.

PURGING | SAMPLING DETAILS:

LAT: 41.40496° LONG: -094.99445°

DTW: 23.47' TOTAL DEPTH: 38.96'

VOLUME: 2.52 GAL PID = ND

NOTE: GROUNDWATER IS VERY TURBID.

WATER QUALITY:

12/13/2011 ATLANTIC, IA GROUNDWATER SITE

TIME	GALLONS PURGED	TEMP	pH	CONDUCTIVITY
1350	2.5	13.65°C	6.60	599 µS/cm
1410	7.5	13.61	6.83	590
1430	12.5	13.10	6.54	584
1446	17.5	13.43	6.44	596
1503	22.5	13.09	6.44	581
1518	27.5	13.09	6.41	575
1540	31.0	13.12	6.41	593

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #	NOTES
1540	5613-102	GWϕ2	TRIPLE VOLUME COLLECTED FOR MS/MSD

1406 IT STARTS TO RAIN. THE TEAM ELECTS TO CONTINUE SAMPLING/PURGING ACTIVITIES.

1600 TEAM PUTS A NEW LOCK ON THE WELL.

1620 TEAM MOVES TO MW-2 LOCATION.

1630 TEAM WAS ABLE TO ACCESS MW-2 BUT WILL SAMPLE IT TOMORROW.

1700 TEAM DEPARTS ATLANTIC GROUNDWATER SITE.

1768 TEAM ARRIVES @ THE HOTEL & FINISHES DOCUMENTING ALL THE SAMPLING ACTIVITIES FOR THE DAY.

12-13-11

0730 WEATHER: RAIN 45°F WIND N@1MPH HUMIDITY 87%

12/14/2011 ATLANTIC, IA GROUNDWATER SITE

0730 [redacted] HAVE A MORNING TAILGATE MEETING IN THE HOTEL PARKING LOT. TO DISCUSS THE DAY'S FIELD ACTIVITIES & THE SAFETY CONCERNS INVOLVED.

0745 TEAM CALIBRATES THE WATER QUALITY METER & THE PID.

0800 TEAM DEPARTS THE HOTEL.

0852 TEAM ARRIVES IN ATLANTIC, IA @ THE WALMART TO PURCHASE ADDITONAL 5-GAL BUCTETS.

0950 TEAM DEPARTS WALMART & ARRIVES @ MONITORING WELL # MW-2. IT IS LOCATED IN THE NORTHERN HALF OF THE UNITED METHODIST CHURCH OFFICE PARKING LOT.

CONTACT INFO:

CHARLES EDWARDS (712) 243-2244
ROLLING HILLS BANK & TRUST
1307 EAST 7TH STREET
ATLANTIC, IA 50022

1020 TEAM CUTS THE WELL LOCK OFF THE WELL CAP. THE WELL COVER HAS BEEN DAMAGED & DOES NOT SECURE CORRECTLY.

PURGING | SAMPLING DETAILS:

LAT: 41.40375° LONG: -094.99576°
DTW: 34.98' TOTAL DEPTH: 48.75'
VOLUME: 2.244 GAL PID = 43.9 ppm
NOTE: WATER IS VERY TURBID

12/14/2011 ATLANTIC, IA GROUNDWATER SITE

WATER QUALITY:

TIME	GALLONS PURGED	TEMP	pH	CONDUCTIVITY
1100	2.5	13.01°C	7.14	558 µS/cm
1126	7.5	13.26	5.67	630
1200	12.5	13.16	6.16	649
1226	17.5	13.37	6.09	628
1244	22.5	13.13	6.13	641
1259	25.0	13.20	6.11	638

NOTE: COULD NOT GET GROUNDWATER TO CLEAR UP.

SAMPLE COLLECTION:

TIME	TAG ID	SAMPLE #
1259	5613-103	GW-03
1259	5613-103-FD	GW-03-FD

1310 TEAM PUTS A NEW LOCK ON WELL MW-2 & SECURES THE WELL COVER AS MUCH AS POSSIBLE.

1320 TEAM PREPS TO COLLECT & DOCUMENT THE REMAINING FIELDBLANK & TRIP BLANK SAMPLES.

SAMPLE COLLECTION:

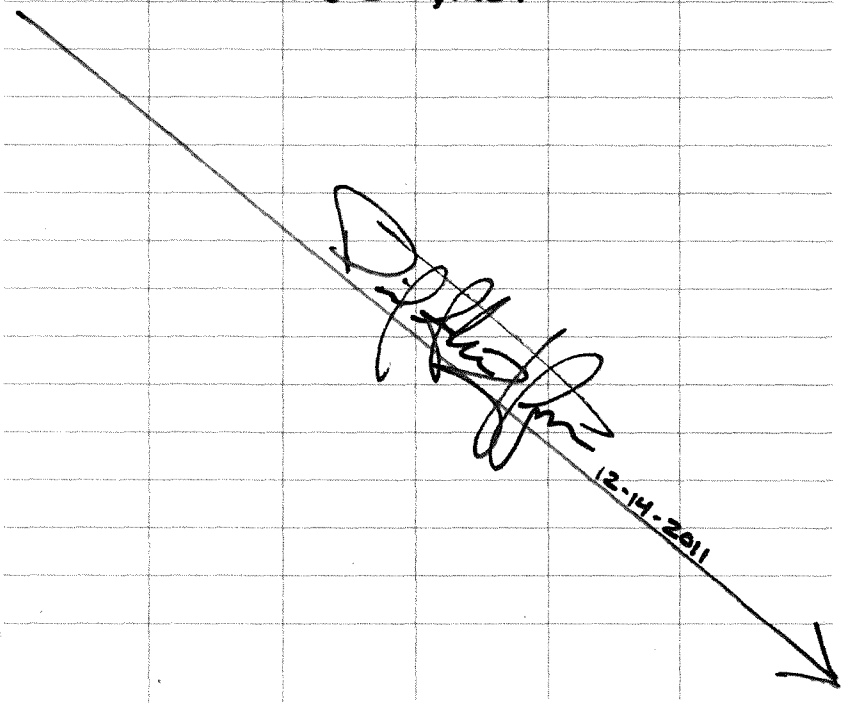
TIME	TAG ID	SAMPLE #	NOTES
1330	5613-107-FB	GW-FB	
0643	5613-11-FB	MGW-TB	TRIP BLANK
0646	5613-104-FB	GW-TB	TRIP BLANK

12/14/2011 ATLANTIC, IA GROUNDWATER SITE

1445 TEAM WRAPS UP SAMPLING ACTIVITIES & MOVES TO THE ATLANTIC WATER TREATMENT FACILITY.

1500 THE TEAM IS DIRECTED BY JOHN MARTENS (DIRECTOR OF WATER OPERATIONS) ON WHERE TO DISPOSE OF THE PURGE WATER FROM MW-2.

1550 THE TEAM FINISHES DISPOSING OF THE MW-2 PURGE WATER. TEAM DEPARTS ATLANTIC, IA & HEADS BACK TO KANSAS CITY, MO.



APPENDIX D

FIELD SHEETS AND CHAIN-OF-CUSTODY RECORDS

CHAIN OF CUSTODY RECORD
ENVIRONMENTAL PROTECTION AGENCY REGION VII

ACTIVITY LEADER(Print)	NAME OF SURVEY OR ACTIVITY	DATE OF COLLECTION	SHEET
[redacted]	Atlantic Water Supply	12,13,14 (DAY) 12 (MONTH) 2011 (YEAR)	1 of 1

CONTENTS OF SHIPMENT

SAMPLE NUMBER	TYPE OF CONTAINERS: CUBITAINER	BOTTLE	BOTTLE	VOA Set 4 ~~BOTTLE~~ VIAL	VOA SET (2 VIALS EA)	SAMPLED MEDIA: water	soil	sediment	dust	other	RECEIVING LABORATORY REMARKS/OTHER INFORMATION (condition of samples upon receipt, other sample numbers, etc.)
	NUMBERS OF CONTAINERS PER SAMPLE NUMBER										
5613-1					1	X					
-1 FD					1	X					
-2					1	X					
-3					1	X					
-4					1	X					
-5					1	X					
-6					3	X					MS/MSD
-7					1	X					
-8					1	X					
-9					1	X					
-10					1	X					
-11-FB					1	X					
-12-FB					1	X					
-101				1		X					* 1 vial broken in field
-102				3		X					MS/MSD
-103				1		X					
-103-FD				1		X					
-105-FB				1		X					
-107-FB				1		X					

ASR Complete

DESCRIPTION OF SHIPMENT

____ PIECE(S) CONSISTING OF ____ BOX(ES)

2 ICE CHEST(S): OTHER ____

MODE OF SHIPMENT

____ COMMERCIAL CARRIER: ____

____ COURIER

X SAMPLER CONVEYED

____ (SHIPPING DOCUMENT NUMBER)

PERSONNEL CUSTODY RECORD

RELINQUISHED BY (SAMPLER)	DATE	TIME	RECEIVED BY	REASON FOR CHANGE OF CUSTODY
[redacted] ☒ SEALED ☐ UNSEALED	12-15-11	1205	RDWiggan ☒ SEALED ☐ UNSEALED	Rec'd at lab
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY
RELINQUISHED BY ☐ SEALED ☐ UNSEALED	DATE	TIME	RECEIVED BY ☐ SEALED ☐ UNSEALED	REASON FOR CHANGE OF CUSTODY

*U.S. GPO: 2002-756-917/40053

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 1 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-1-~~50~~ DW

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW01

Expected Conc:	(or Circle One: Low Medium High)		**Date**	**Time(24 hr)**
Latitude: 41.49011		**Sample Collection: Start:**	12/13/11	~~9~~ 941
Longitude: -094.96871		**End:**	__/__/__	__:__

Laboratory Analyses:

	Container	Preservative	Holding Time	Analysis
3 ~~DW~~	3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: (N/A)

MUNICIPAL WELL # AMU-7

NOTE: FIELD DUPLICATE COLLECTED

WATER QUALITY & PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
0920	12.51°C	7.27	609 µS/cm
0925	12.17	6.36	596
0930	12.13	6.11	596
0934	12.09	5.97	594
0938	11.95	5.94	592
0941	12.07	6.01	593

CONTACT INFO:

JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** ~~11~~ 1 DW **QC Code:** FD **Matrix:** Water **Tag ID:** 5613-~~11~~-~~58~~ 1-FD +2 DW

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW01-FD

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.49811 **Sample Collection: Start:** 12/13/11 9:41
Longitude: -094.96871 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: (N/A)

MUNICIPAL WELL # AMW-7

NOTE: THIS IS A FIELD DUPLICATE SAMPLE OF MGW01.

WATER QUALITY & PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
0920	12.51°C	7.27	609 µS/cm
0925	12.17	6.36	596
0930	12.13	6.11	596
0934	12.09	5.97	594
0938	11.95	5.94	592
0941	12.07	6.01	593

CONTACT INFO:

JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted] START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 2 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-2-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW02

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41625 **Sample Collection: Start:** 12/13/11 10:24
Longitude: -094.99625 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: MUNICIPAL WELL # AMW-16

(N/A)

WATER QUALITY & PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
1014	10.46°C	6.13	285 µS/cm
1017	10.93	6.39	293
1020	11.00	6.50	293
1024	10.99	6.46	294

CONTACT INFO: JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 3 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-3-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGWØ3

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.415333 **Sample Collection: Start:** 12/13/11 10:51
Longitude: -094.99300 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: MUNICIPAL WELL # AMW-13
(N/A)

WATER QUALITY 4
PURGING DETAILS :

TIME	TEMP	pH	CONDUCTIVITY
1043	10.70°C	6.35	276 µS/cm
1046	10.76	6.40	282
1049	10.86	6.40	283
1051	10.87	6.41	283

CONTACT INFO : JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted]

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 4 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-4-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW 04

Expected Conc: (or Circle One: Low Medium High)

			Date	**Time(24 hr)**
Latitude:	41.41173	**Sample Collection: Start:**	12/13/11	11:06
Longitude:	-094.99313	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments:
MUNICIPAL WELL # AMW-11

(N/A)

WATER QUALITY @

PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
1059	10.76°C	6.37	570 µS/cm
1101	10.76	6.40	574
1106	10.78	6.42	578

CONTACT INFO: JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA
712-243-1395

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 5 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-5-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW05

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41080 **Sample Collection: Start:** 12/13/11 11:21
Longitude: -094.99516 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: MUNICIPAL WELL # AMW-10
(N/A)

WATER QUALITY & PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
1113	11.80°C	6.60	383 µS/cm
1116	11.85	6.69	399 µS/cm
1121	11.88	6.61	393

CONTACT INFO: JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022

Sample Collected By: [redacted] START 712-243-1395

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 6 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-6-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW06

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41366 **Sample Collection: Start:** 12/13/11 11:44
Longitude: -094.99455 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: (N/A)

MUNICIPAL WELL # AMW-17
NOTE: TRIPLE VOLUME COLLECTED. FOR MS/MSD

WATER QUALITY #

PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
1134	11.03°C	6.69	336 µS/cm
1138	11.09	6.58	337
1144	11.13	6.54	337

CONTACT INFO: JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC, MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022

Sample Collected By: [redacted]-START 712-243-1395

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 7 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-7-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW07

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41273° **Sample Collection: Start:** 12/13/11 12:09
Longitude: -094.99156° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: MUNICIPLE WELL # AMW-12
(N/A)

WATER QUALITY #

PURGING DETAILS :

TIME	TEMP	pH	CONDUCTIVITY
1159	10.90°C	6.50	398 µS/cm
1202	11.01	6.51	381
1209	11.05	6.51	382

CONTACT INFO: JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 8 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-8-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW 08

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41487° **Sample Collection: Start:** 12/13/11 12:26
Longitude: -094.98976° **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments:
MUNICIPAL WELL # AMU-15
(N/A)

WATER QUALITY #
PURGING DETAILS :

TIME	TEMP	pH	CONDUCTIVITY
1220	10.85°C	6.46	290 µS/cm
1224	11.00	6.47	288
1226	11.01	6.51	288

CONTACT INFO : JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 N. 3RD ST. BOX 517
ATLANTIC, IA 50022

Sample Collected By: [redacted]-START 712-243-1395

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 9 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-9-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW09

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41706' **Sample Collection: Start:** 12/13/11 12:42
Longitude: -094.99096' **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments:
(N/A)

MUNICIPAL WELL # AMW-14

WATER QUALITY #

PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
1235	10.97°C	6.30	279 µS/cm
1238	11.03	6.34	279
1242	11.07	6.38	279

CONTACT INFO:

JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 10 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-10-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA sample

External Sample Number: MGW 10

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.41006 **Sample Collection: Start:** 12/13/11 12:52
Longitude: -094.99767 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments: MUNICIPAL WELL # AMW-6.
(N/A)

WATER QUALITY & PURGING DETAILS:

TIME	TEMP	pH	CONDUCTIVITY
1245	11.26°C	6.62	391 µS/cm
1248	11.40	6.51	400
1252	11.47	6.48	398

CONTACT INFO:

JOHN MARTENS
DIRECTOR OF WATER OPERATIONS
ATLANTIC MUNICIPAL UTILITIES
15 W. 3RD ST. BOX 517
ATLANTIC, IA 50022
712-243-1395

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** ~~12~~ 11 **QC Code:** FB **Matrix:** Water **Tag ID:** 5613-~~12~~ 11 DW -FB

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA ~~sample~~ DW TRIP BLANK SAMPLE

External Sample Number: MGW-TB

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude:	N/A	**Sample Collection: Start:** 12/7/11 DW	06:45 DW
Longitude:	N/A	**End:** __/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments:

(N/A)

NOTE: TRIP BLANK SAMPLE

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 13 → 12 RØ **QC Code:** FB **Matrix:** Water **Tag ID:** 5613-13-FB → 5613-12-FB RØ

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: DW VOA Trip Blank sample → FIELD

External Sample Number: MGW-FB

Expected Conc:	(or Circle One: Low Medium High)		**Date**	**Time(24 hr)**
Latitude:	N/A	**Sample Collection: Start:**	12/13/11	12:56
Longitude:	N/A	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
3 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Drinking Water by GC/MS

Sample Comments:

(N/A) NOTE: FIELD BLANK SAMPLE.

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** ~~106~~ 101 DW **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-~~10~~1 DW-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: LDL VOA sample

External Sample Number: GWΦ1

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.40390° **Sample Collection: Start:** 12/12/11 15:45
Longitude: -094.99432 **End:** __/__/__ __:__

Laboratory Analyses:

3 DW Container	Preservative	Holding Time	Analysis
40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments: MONITORING WELL # MW-1
(N/A) NOTE: ALL MEASUREMENTS TAKEN FROM THE TOP OF THE WELL CASING. MONITORING WELL LOCATION IS IN THE NE CORNER OF THE BURGER KING PARKING LOT.

PID = ND DEPTH TO WATER = 31.50' TOTAL WELL DEPTH = 44.56'
VOLUME = ~~25.56 GAL~~ DW 2.13 GAL NOTE: WATER WAS VERY TURBID.

WATER QUALITY & PURGING DETAILS:

TIME	GALLONS PURGED	TEMP	pH	CONDUCTIVITY	TAG ID	SAMPLE ID
1435	2.5 GAL	12.78°C	7.05	562 µS/cm		
1445	7.5	12.39	6.66	521		
1456	12.5	12.68	6.58	538		
1505	17.5	12.31	6.61	533		
1520	22.5	12.53	6.97	530		
1536	25.0	12.41	6.69	528	5613-101	GWΦ1

Sample Collected By: [redacted]-START

NOTE: 1-40mL VOA VIAL BROKE DURING TRANSIT.

CONTACT INFO: BURGER KING 1309 E. 7TH ST. ATLANTIC, IA 50022 712-243-1954

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 102 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-102-__

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: LDL VOA sample

External Sample Number: GW02

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.40496° **Sample Collection: Start:** 12/13/11 15:40
Longitude: -094.99445° **End:** __/__/__ __:__

Laboratory Analyses:

12 SW Container	Preservative	Holding Time	Analysis
A - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A)

NOTE: ALL MEASUREMENTS TAKEN FROM THE TOP OF THE WELL CASING. MONITORING WELL LOCATION IS IN SW CORNER OF THE SELF STORAGE COMPLEX ON THE TRAILOR PARK PROPERTY. TRIPLE VOLUME COLLECTED FOR MS/MSD

PID = ND
DEPTH TO WATER = 23.47'
WELL DEPTH = 38.96'
VOLUME = ~~10.10 GAL~~ ON 2.52GAL

MONITORING WELL # MW-3
NOTE: WATER WAS VERY TURBID.

WATER QUALITY & PURGING DETAILS:

TIME	GALLONS PURGED	TEMP	pH	CONDUCTIVITY	TAG ID	SAMPLE ID
1350	2.56AL	13.65°C	6.60	599 µS/cm		
1410	7.5	13.61	6.83	590		
1430	12.5	13.10	6.54	584		
1446	17.5	13.43	6.44	596		
1503	22.5	13.09	6.44	581		
1518	27.5	13.09	6.41	575		
1540	31.0	13.12	6.41	593	5613-102	GW02

Sample Collected By: [redacted]-START

CONTACT INFO: JIM REISCHL
PO BOX 60 DUNLAP, IA 51529
712-243-5211

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 103 **QC Code:** __ **Matrix:** Water **Tag ID:** 5613-103-~~50~~ DW

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: LDL VOA sample

External Sample Number: GW03

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.40375' **Sample Collection: Start:** 12/14/11 12:59
Longitude: -094.99576' **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

4 DW

Sample Comments:

(N/A) NOTE: MONITORING WELL LOCATION IS IN THE NORTHERN HALF OF THE UNITED METHODIST CHURCH OFFICE PARKING LOT. FIELD DUPLICATE COLLECTED @ THIS LOCATION.

MONITORING WELL # MW-2

PID = 43.9 ppm DEPTH TO WATER = 34.98' WELL DEPTH = 48.75'

VOLUME = 2.244 GAL NOTE: WATER IS VERY TURBID & WOULD NOT CLEAR UP.

WATER QUALITY & PURGING DETAILS:

TIME	GALLONS PURGED	TEMP	pH	CONDUCTIVITY	TAG ID	SAMPLE ID
1100	2.5 GAL.	13.01°C	7.14	558 µS/cm		
1126	7.5	13.26	5.67	630		
1200	12.5	13.16	6.16	649		
1226	17.5	13.37	6.09	628		
1244	22.5	13.13	6.13	641		
1259	25.0	13.20	6.11	638	5613-103	GW03

Sample Collected By: [redacted]-START

CONTACT INFO: CHARLES EDWARDS - ROLLING HILLS BANK & TRUST
1807 E. 7TH ST. ATLANTIC, IA 50022
712-243-2244

Sample Collection Field Sheet

US EPA Region 7
Kansas City, KS

-103-FD
5613-105

ASR Number: 5613 **Sample Number:** 104 (3 DW) **QC Code:** FD **Matrix:** Water **Tag ID:** 5613-104-FD (3 DW)

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: LDL VOA sample

External Sample Number: GW03-FD

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: 41.40375 **Sample Collection: Start:** 12/14/11 12:59
Longitude: -094.99576 **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments: (N/A) NOTE: ALL MEASUREMENTS TAKEN FROM THE TOP OF THE WELL CASING. MONITORING WELL LOCATION IS IN THE NORTHERN HALF OF THE UNITED METHODIST CHURCH OFFICE PARKING LOT. THIS IS A FIELD DUPLICATE OF GW03.

MONITORING WELL # MW-2

PID = 43.9 ppm DEPTH TO WATER = 34.98' WELL DEPTH = 48.75'
VOLUME = 2.244 GAL NOTE: WATER IS VERY TURBID. & WOULD NOT CLEAR UP.

WATER QUALITY & PURGING DETAILS:

TIME	GALLONS PURGED	TEMP	pH	CONDUCTIVITY	TAG ID	SAMPLE ID
1100	2.5 GAL	13.01°C	7.14	558 µS/cm		
1126	7.5	13.26	5.67	630		
1200	12.5	13.16	6.16	649		
1226	17.5	13.37	6.09	628		
1244	22.5	13.13	6.13	641		
1259	25.0	13.26	6.11	638	5613-103-FD	GW03-FD

Sample Collected By: [redacted]-START

CONTACT INFO: CHARLES EDWARDS - ROLLING HILLS BANK & TRUST
1307 E 7TH ST.
ATLANTIC, IA 50022
712-243-2244

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 105 **QC Code:** FB **Matrix:** Water **Tag ID:** 5613-105-FB

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: LDL VOA sample TRIP BLANK SAMPLE

External Sample Number: GW-TB

Expected Conc: (or Circle One: Low Medium High)

		Date	Time(24 hr)
Latitude:	N/A	**Sample Collection: Start:**	12/14/11	14:30
Longitude:	N/A	**End:**	__/__/__	__:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A) NOTE: TRIP BLANK SAMPLE.

Sample Collected By: [redacted]-START

Sample Collection Field Sheet
US EPA Region 7
Kansas City, KS

ASR Number: 5613 **Sample Number:** 107 **QC Code:** FB **Matrix:** Water **Tag ID:** 5613-107-FB

Project ID: RKA72Q00 **Project Manager:** Ron King
Project Desc: Atlantic Water Supply - Site Reassessment sampling
City: Atlantic **State:** Iowa
Program: Superfund
Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION **Site ID:** A72Q **Site OU:** 00

Location Desc: LDL VOA Trip Blank sample FIELD BLANK

External Sample Number: GW-FB

Expected Conc: (or Circle One: Low Medium High) **Date** **Time(24 hr)**

Latitude: N/A **Sample Collection: Start:** 12/14/11 13:30
Longitude: N/A **End:** __/__/__ __:__

Laboratory Analyses:

Container	Preservative	Holding Time	Analysis
4 - 40mL VOA vial	4 Deg C, HCL to pH<2	14 Days	1 VOCs in Water by GC/MS for Low Detection Limits

Sample Comments:

(N/A) NOTE: FIELD BLANK SAMPLE.

Sample Collected By: [redacted]-START

APPENDIX E

ANALYTICAL RESULTS

United States Environmental Protection Agency
Region 7
901 N. 5th Street
Kansas City, KS 66101

Date: 01/10/2012

Subject: Transmittal of Sample Analysis Results for ASR #: 5613

Project ID: RKA72Q00

Project Description: Atlantic Water Supply - Site Reassessment sampling

From: Michael F. Davis, Chief
Chemical Analysis and Response Branch, Environmental Services Division

To: Ron King
SUPR/ERNB

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the enclosed Customer Satisfaction Survey and Data Disposition/Sample Release memo for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Data Disposition/Sample Release memo.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Ron King Org: SUPR/ERNB Phone: 913-551-7568

Project ID: RKA72Q00

Project Desc: Atlantic Water Supply - Site Reassessment sampling

Location: Atlantic State: Iowa Program: Superfund

Site Name: ATLANTIC WATER SUPPLY - SITE EVALUATION/DISPOSITION

Site ID: A72Q Site OU: 00

GPRA PRC: 303DD2

Purpose: Site Characterization

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FB = Field Blank
FD = Field Duplicate

Units: Specific units in which results are reported.

SU = Standard Units (pH)
Deg C = Degrees Celsius
ug/L = Micrograms per Liter
umhos/cm = Micromhos per Centimeter

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.
U = The analyte was not detected at or above the reporting limit.
UJ = The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

Project ID: RKA72Q00 Project Desc: Atlantic Water Supply - Site Reassessment sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1	__	Water	MGW-01 (AMU-7)		12/13/2011	09:41			12/15/2011
1	FD	Water	MGW-01 (AMU-7)/Field Duplicate of sample 1		12/13/2011	09:41			12/15/2011
2	__	Water	MGW-02 (AMU-16)		12/13/2011	10:24			12/15/2011
3	__	Water	MGW-03 (AMU-13)		12/13/2011	10:51			12/15/2011
4	__	Water	MGW-04 (AMU-11)		12/13/2011	11:06			12/15/2011
5	__	Water	MGW-05 (AMU-10)		12/13/2011	11:21			12/15/2011
6	__	Water	MGW-06 (AMU-17)		12/13/2011	11:44			12/15/2011
7	__	Water	MGW-07 (AMU-12)		12/13/2011	12:09			12/15/2011
8	__	Water	MGW-08 (AMU-15)		12/13/2011	12:26			12/15/2011
9	__	Water	MGW-09 (AMU-14)		12/13/2011	12:42			12/15/2011
10	__	Water	MGW-10 (AMU-6)		12/13/2011	12:52			12/15/2011
11	FB	Water	MGW-DW VOA Trip Blank sample		12/07/2011	06:43			12/15/2011
12	FB	Water	DW VOA Field Blank sample		12/13/2011	12:56			12/15/2011
101	__	Water	GW-01 (MW-1)		12/12/2011	15:45			12/15/2011
102	__	Water	GW-02 (MW-3)		12/13/2011	15:40			12/15/2011
103	__	Water	GW-03 (MW-2)		12/14/2011	12:59			12/15/2011
103	FD	Water	GW-03 (MW-2)/Field Duplicate of sample 103		12/14/2011	12:59			12/15/2011
105	FB	Water	LDL VOA Trip Blank sample		12/07/2011	06:46			12/15/2011
107	FB	Water	LDL VOA Field Blank sample		12/14/2011	13:30			12/15/2011

Analysis	Comments About Results For This Analysis

1 Conductivity by Field Measurement

Lab: (Field Measurement)

Method: Measurement of field parameter

Samples: 1-__ 1-FD 2-__ 3-__ 4-__ 5-__ 6-__
7-__ 8-__ 9-__ 10-__ 101-__ 102-__ 103-__
103-FD

Comments:
(N/A)

1 pH of Water by Field Measurement

Lab: (Field Measurement)

Method: Measurement of field parameter

Samples: 1-__ 1-FD 2-__ 3-__ 4-__ 5-__ 6-__
7-__ 8-__ 9-__ 10-__ 101-__ 102-__ 103-__
103-FD

Comments:
(N/A)

1 Temperature of Water by Field Measurement

Lab: (Field Measurement)

Method: Measurement of field parameter

Samples: 1-__ 1-FD 2-__ 3-__ 4-__ 5-__ 6-__
7-__ 8-__ 9-__ 10-__ 101-__ 102-__ 103-__
103-FD

Comments:
(N/A)

1 VOCs in Drinking Water by GC/MS

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3230.9E

Samples: 1-__ 1-FD 2-__ 3-__ 4-__ 5-__ 6-__
7-__ 8-__ 9-__ 10-__ 11-FB 12-FB

Comments:
1,2-Dibromo-3-Chloropropane (29.48%) was low in the initial calibration and was UJ-coded in samples 5613-1, 5613-2, 5613-3, 5613-4, 5613-5, 5613-6, 5613-7, 5613-8, 5613-9, 5613-10, 5613-11-FB, and 5613-12-FB. This analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the initial instrument calibration not meeting specifications. The actual reporting limit may be higher than the reported value.

Analysis	Comments About Results For This Analysis

Dichlorodifluoromethane (40.3%) was biased low and was UJ-coded in samples 5613-1, 5613-2, 5613-3, 5613-4, 5613-5, 5613-6, 5613-7, 5613-8, 5613-9, 5613-10, 5613-11-FB, and 5613-12-FB. This analyte was not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the continuing calibration check not meeting specifications. The actual reporting limit may be higher than the reported value.

Trichlorofluoromethane (69%, 79 - 129%), Carbon Tetrachloride (78%, 79 - 124%), Isopropylbenzene (84%, 95 - 134%), and Hexachlorobutadiene (73%, 85 - 128%) were low and were UJ-coded in samples 5613-1, 5613-2, 5613-3, 5613-4, 5613-5, 5613-6, 5613-7, 5613-8, 5613-9, 5613-10, 5613-11-FB, and 5613-12-FB. The analytes were not found in the samples at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to the low recovery of the analytes in the laboratory control sample. The actual reporting limit for these analytes may be higher than the reported value.

Styrene (48%, 56 - 133%), 1,2,4-Trimethylbenzene (61%, 76 - 129%), and 1,3,5-Trimethylbenzene (64%, 79 - 127%) were biased low and were UJ-coded in sample 5613-6. The analytes were not found in the sample at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to low recovery of the analytes in the laboratory matrix spike. The actual reporting limit for these analytes may be higher than the reported value.

Hexachlorobutadiene (81%, 82 - 128%), Styrene (46%, 56 - 133%), 1,2,4-Trimethylbenzene (57%, 76 - 129%), and 1,3,5-Trimethylbenzene (61%, 79 - 127%) were biased low and were UJ-coded in sample 5613-6. The analytes were not found in the sample at or above the reporting limit however, the reporting limit is an estimate (UJ-coded) due to low recovery of the analytes in the laboratory matrix spike duplicate. The actual reporting limit for these analytes may be higher than the reported value.

1 VOCs in Water by GC/MS for Low Detection Limits

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3230.13E

Samples: 101-__ 102-__ 103-__ 103-FD 105-FB 107-FB

Comments:
Styrene (20.63%) was UJ-coded in samples 101-103, 103-FD, 105-FB, and 107-FB. This analyte was not found in the samples at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to the initial instrument calibration curve not meeting linearity specifications. The actual reporting limit may be higher than the reported value.

Acetone (69%, 70%-130%) and 2-Hexanone (67%, 70%-130%) were UJ-coded in samples 101-103, 103-FD, 105-FB, and 107-FB. These analytes were not found in the samples at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to the second source verification standard not meeting QC limits. The actual reporting limit may be higher than the reported value.

Analysis	Comments About Results For This Analysis

Bromomethane (14RPD, 12PCL) was UJ-coded in sample 102. This analyte was not found in the sample at or above the reporting limit, however, the reporting limit is an estimate (UJ-coded) due to poor precision obtained for this analyte in the laboratory matrix spike and matrix spike duplicate. The actual reporting limit for this analyte may be higher than the reported value.

Analysis/ Analyte	Units	1-__	1-FD	2-__	3-__
1 Conductivity by Field Measurement					
Conductivity	umhos/cm	593	593	294	283
1 pH of Water by Field Measurement					
pH	SU	6.01	6.01	6.46	6.41
1 Temperature of Water by Field Measurement					
Temperature	Deg C	12.07	12.07	10.99	10.87
1 VOCs in Drinking Water by GC/MS					
Acetone	ug/L	10 U	10 U	10 U	10 U
Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromochloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
sec-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
tert-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Tetrachloride	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorotoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Chlorotoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-Chloropropane	ug/L	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Dibromochloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	1-__	1-FD	2-__	3-__
Hexachlorobutadiene	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Isopropylbenzene	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
p-Isopropyltoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Methylene Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-Pentanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
n-Propylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Styrene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	87	87	0.50 U	0.50 U
Toluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,3-Trichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	ug/L	1.3	1.3	0.50 U	0.50 U
Trichlorofluoromethane	ug/L	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,2,3-Trichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trimethylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3,5-Trimethylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	4-__	5-__	6-__	7-__
1 Conductivity by Field Measurement					
Conductivity	umhos/cm	578	393	337	382
1 pH of Water by Field Measurement					
pH	SU	6.42	6.61	6.54	6.51
1 Temperature of Water by Field Measurement					
Temperature	Deg C	10.78	11.88	11.13	11.05
1 VOCs in Drinking Water by GC/MS					
Acetone	ug/L	10 U	10 U	10 U	10 U
Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromochloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
sec-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
tert-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Tetrachloride	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorotoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Chlorotoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-Chloropropane	ug/L	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Dibromochloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	4-__	5-__	6-__	7-__
Hexachlorobutadiene	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Isopropylbenzene	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
p-Isopropyltoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Methylene Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-Pentanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
n-Propylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Styrene	ug/L	0.50 U	0.50 U	0.50 UJ	0.50 U
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,3-Trichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane	ug/L	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,2,3-Trichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trimethylbenzene	ug/L	0.50 U	0.50 U	0.50 UJ	0.50 U
1,3,5-Trimethylbenzene	ug/L	0.50 U	0.50 U	0.50 UJ	0.50 U
Vinyl Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	8-__	9-__	10-__	11-FB
1 Conductivity by Field Measurement					
Conductivity	umhos/cm	288	279	398	
1 pH of Water by Field Measurement					
pH	SU	6.51	6.38	6.48	
1 Temperature of Water by Field Measurement					
Temperature	Deg C	11.01	11.07	11.47	
1 VOCs in Drinking Water by GC/MS					
Acetone	ug/L	10 U	10 U	10 U	10 U
Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromochloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromodichloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromoform	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Bromomethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Butanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
n-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
sec-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
tert-Butylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Disulfide	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Carbon Tetrachloride	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
Chlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloroform	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Chloromethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2-Chlorotoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Chlorotoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromo-3-Chloropropane	ug/L	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
Dibromochloromethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dibromoethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Dibromomethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,4-Dichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Dichlorodifluoromethane	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
1,1-Dichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,2-Dichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2-Dichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
2,2-Dichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
cis-1,3-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
trans-1,3-Dichloropropene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Ethyl Benzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	8-__	9-__	10-__	11-FB
Hexachlorobutadiene	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
2-Hexanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Isopropylbenzene	ug/L	0.50 UJ	0.50 UJ	0.50 UJ	0.50 UJ
p-Isopropyltoluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Methylene Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
4-Methyl-2-Pentanone	ug/L	5.0 U	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
n-Propylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Styrene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1,2-Tetrachloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L	0.50 U	0.50 U	3.6	0.50 U
Toluene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,3-Trichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trichlorobenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,1-Trichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,1,2-Trichloroethane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichloroethene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Trichlorofluoromethane	ug/L	1.0 UJ	1.0 UJ	1.0 UJ	1.0 UJ
1,2,3-Trichloropropane	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,2,4-Trimethylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
1,3,5-Trimethylbenzene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
Vinyl Chloride	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
m and/or p-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U
o-Xylene	ug/L	0.50 U	0.50 U	0.50 U	0.50 U

Analysis/ Analyte	Units	12-FB	101-__	102-__	103-__
1 Conductivity by Field Measurement					
Conductivity	umhos/cm		528	593	638
1 pH of Water by Field Measurement					
pH	SU		6.69	6.41	6.11
1 Temperature of Water by Field Measurement					
Temperature	Deg C		12.41	13.12	13.20
1 VOCs in Drinking Water by GC/MS					
Acetone	ug/L	10 U			
Benzene	ug/L	0.50 U			
Bromobenzene	ug/L	0.50 U			
Bromochloromethane	ug/L	0.50 U			
Bromodichloromethane	ug/L	0.50 U			
Bromoform	ug/L	0.50 U			
Bromomethane	ug/L	1.0 U			
2-Butanone	ug/L	5.0 U			
n-Butylbenzene	ug/L	0.50 U			
sec-Butylbenzene	ug/L	0.50 U			
tert-Butylbenzene	ug/L	0.50 U			
Carbon Disulfide	ug/L	0.50 U			
Carbon Tetrachloride	ug/L	0.50 UJ			
Chlorobenzene	ug/L	0.50 U			
Chloroethane	ug/L	0.50 U			
Chloroform	ug/L	0.50 U			
Chloromethane	ug/L	1.0 U			
2-Chlorotoluene	ug/L	0.50 U			
4-Chlorotoluene	ug/L	0.50 U			
1,2-Dibromo-3-Chloropropane	ug/L	1.0 UJ			
Dibromochloromethane	ug/L	0.50 U			
1,2-Dibromoethane	ug/L	0.50 U			
Dibromomethane	ug/L	0.50 U			
1,2-Dichlorobenzene	ug/L	0.50 U			
1,3-Dichlorobenzene	ug/L	0.50 U			
1,4-Dichlorobenzene	ug/L	0.50 U			
Dichlorodifluoromethane	ug/L	0.50 UJ			
1,1-Dichloroethane	ug/L	0.50 U			
1,2-Dichloroethane	ug/L	0.50 U			
1,1-Dichloroethene	ug/L	0.50 U			
cis-1,2-Dichloroethene	ug/L	0.50 U			
trans-1,2-Dichloroethene	ug/L	0.50 U			
1,2-Dichloropropane	ug/L	0.50 U			
1,3-Dichloropropane	ug/L	1.0 U			
2,2-Dichloropropane	ug/L	0.50 U			
1,1-Dichloropropene	ug/L	0.50 U			
cis-1,3-Dichloropropene	ug/L	0.50 U			
trans-1,3-Dichloropropene	ug/L	0.50 U			
Ethyl Benzene	ug/L	0.50 U			

Analysis/ Analyte	Units	12-FB	101-__	102-__	103-__
Hexachlorobutadiene	ug/L	0.50 UJ			
2-Hexanone	ug/L	5.0 U			
Isopropylbenzene	ug/L	0.50 UJ			
p-Isopropyltoluene	ug/L	0.50 U			
Methylene Chloride	ug/L	0.50 U			
4-Methyl-2-Pentanone	ug/L	5.0 U			
Naphthalene	ug/L	1.0 U			
n-Propylbenzene	ug/L	0.50 U			
Styrene	ug/L	0.50 U			
1,1,1,2-Tetrachloroethane	ug/L	0.50 U			
1,1,2,2-Tetrachloroethane	ug/L	1.0 U			
Tetrachloroethene	ug/L	0.50 U			
Toluene	ug/L	0.50 U			
1,2,3-Trichlorobenzene	ug/L	0.50 U			
1,2,4-Trichlorobenzene	ug/L	0.50 U			
1,1,1-Trichloroethane	ug/L	0.50 U			
1,1,2-Trichloroethane	ug/L	0.50 U			
Trichloroethene	ug/L	0.50 U			
Trichlorofluoromethane	ug/L	1.0 UJ			
1,2,3-Trichloropropane	ug/L	0.50 U			
1,2,4-Trimethylbenzene	ug/L	0.50 U			
1,3,5-Trimethylbenzene	ug/L	0.50 U			
Vinyl Chloride	ug/L	0.50 U			
m and/or p-Xylene	ug/L	0.50 U			
o-Xylene	ug/L	0.50 U			
1 VOCs in Water by GC/MS for Low Detection Limits					
Acetone	ug/L		5.0 UJ	5.0 UJ	5.0 UJ
Benzene	ug/L		1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L		1.0 U	1.0 U	1.0 U
Bromoform	ug/L		1.0 U	1.0 U	1.0 U
Bromomethane	ug/L		1.0 U	1.0 UJ	1.0 U
2-Butanone	ug/L		5.0 U	5.0 U	5.0 U
Carbon Disulfide	ug/L		1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	ug/L		1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L		1.0 U	1.0 U	1.0 U
Chloroethane	ug/L		1.0 U	1.0 U	1.0 U
Chloroform	ug/L		1.0 U	1.0 U	1.0 U
Chloromethane	ug/L		1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L		1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	ug/L		5.0 U	5.0 U	5.0 U
Dibromochloromethane	ug/L		1.0 U	1.0 U	1.0 U
1,2-Dibromoethane	ug/L		1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L		1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L		1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L		1.0 U	1.0 U	1.0 U

Analysis/ Analyte	Units	12-FB	101-__	102-__	103-__
Dichlorodifluoromethane	ug/L		1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L		1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L		1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L		1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L		1.0 U	1.0 U	3.7
trans-1,2-Dichloroethene	ug/L		1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L		1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L		1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L		1.0 U	1.0 U	1.0 U
Ethyl Benzene	ug/L		1.0 U	1.0 U	1.0 U
2-Hexanone	ug/L		5.0 UJ	5.0 UJ	5.0 UJ
Isopropylbenzene	ug/L		1.0 U	1.0 U	1.0 U
Methyl Acetate	ug/L		5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether	ug/L		1.0 U	1.0 U	1.0 U
Methylcyclohexane	ug/L		1.0 U	1.0 U	1.0 U
Methylene Chloride	ug/L		1.0 U	1.0 U	1.0 U
4-Methyl-2-Pentanone	ug/L		5.0 U	5.0 U	5.0 U
Naphthalene	ug/L		2.0 U	2.0 U	2.0 U
Styrene	ug/L		1.0 UJ	1.0 UJ	1.0 UJ
1,1,2,2-Tetrachloroethane	ug/L		1.0 U	1.0 U	1.0 U
Tetrachloroethene	ug/L		1.0 U	1.0 U	2500
Toluene	ug/L		1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	ug/L		1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L		1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L		1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L		1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L		1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	ug/L		1.0 U	1.0 U	1.0 U
1,1,2-Trichlorotrifluoroethane	ug/L		1.0 U	1.0 U	1.0 U
Vinyl Chloride	ug/L		1.0 U	1.0 U	1.0 U
m and/or p-Xylene	ug/L		2.0 U	2.0 U	2.0 U
o-Xylene	ug/L		1.0 U	1.0 U	1.0 U

Analysis/ Analyte	Units	103-FD	105-FB	107-FB
1 Conductivity by Field Measurement				
Conductivity	umhos/cm	638		
1 pH of Water by Field Measurement				
pH	SU	6.11		
1 Temperature of Water by Field Measurement				
Temperature	Deg C	13.20		
1 VOCs in Water by GC/MS for Low Detection Limits				
Acetone	ug/L	5.0 UJ	5.0 UJ	5.0 UJ
Benzene	ug/L	1.0 U	1.0 U	1.0 U
Bromodichloromethane	ug/L	1.0 U	1.0 U	1.0 U
Bromoform	ug/L	1.0 U	1.0 U	1.0 U
Bromomethane	ug/L	1.0 U	1.0 U	1.0 U
2-Butanone	ug/L	5.0 U	5.0 U	5.0 U
Carbon Disulfide	ug/L	1.0 U	1.0 U	1.0 U
Carbon Tetrachloride	ug/L	1.0 U	1.0 U	1.0 U
Chlorobenzene	ug/L	1.0 U	1.0 U	1.0 U
Chloroethane	ug/L	1.0 U	1.0 U	1.0 U
Chloroform	ug/L	1.0 U	1.0 U	1.0 U
Chloromethane	ug/L	1.0 U	1.0 U	1.0 U
Cyclohexane	ug/L	1.0 U	1.0 U	1.0 U
1,2-Dibromo-3-Chloropropane	ug/L	5.0 U	5.0 U	5.0 U
Dibromochloromethane	ug/L	1.0 U	1.0 U	1.0 U
1,2-Dibromoethane	ug/L	1.0 U	1.0 U	1.0 U
1,2-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U
1,3-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U
1,4-Dichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U
Dichlorodifluoromethane	ug/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U
1,2-Dichloroethane	ug/L	1.0 U	1.0 U	1.0 U
1,1-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U
cis-1,2-Dichloroethene	ug/L	3.8	1.0 U	1.0 U
trans-1,2-Dichloroethene	ug/L	1.0 U	1.0 U	1.0 U
1,2-Dichloropropane	ug/L	1.0 U	1.0 U	1.0 U
cis-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U
trans-1,3-Dichloropropene	ug/L	1.0 U	1.0 U	1.0 U
Ethyl Benzene	ug/L	1.0 U	1.0 U	1.0 U
2-Hexanone	ug/L	5.0 UJ	5.0 UJ	5.0 UJ
Isopropylbenzene	ug/L	1.0 U	1.0 U	1.0 U
Methyl Acetate	ug/L	5.0 U	5.0 U	5.0 U
Methyl tert-butyl ether	ug/L	1.0 U	1.0 U	1.0 U
Methylcyclohexane	ug/L	1.0 U	1.0 U	1.0 U
Methylene Chloride	ug/L	1.0 U	1.0 U	1.0 U
4-Methyl-2-Pentanone	ug/L	5.0 U	5.0 U	5.0 U
Naphthalene	ug/L	2.0 U	2.0 U	2.0 U
Styrene	ug/L	1.0 UJ	1.0 UJ	1.0 UJ
1,1,2,2-Tetrachloroethane	ug/L	1.0 U	1.0 U	1.0 U

Analysis/ Analyte	Units	103-FD	105-FB	107-FB
Tetrachloroethene	ug/L	2400	1.0 U	1.0 U
Toluene	ug/L	1.0 U	1.0 U	1.0 U
1,2,3-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U
1,2,4-Trichlorobenzene	ug/L	1.0 U	1.0 U	1.0 U
1,1,1-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichloroethane	ug/L	1.0 U	1.0 U	1.0 U
Trichloroethene	ug/L	1.0 U	1.0 U	1.0 U
Trichlorofluoromethane	ug/L	1.0 U	1.0 U	1.0 U
1,1,2-Trichlorotrifluoroethane	ug/L	1.0 U	1.0 U	1.0 U
Vinyl Chloride	ug/L	1.0 U	1.0 U	1.0 U
m and/or p-Xylene	ug/L	2.0 U	2.0 U	2.0 U
o-Xylene	ug/L	1.0 U	1.0 U	1.0 U